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Left: Marble funerary bust which has a coral-colored inset on the forehead. South Arabia. Ca. 1st century B.C.—1st century A.D. Height 13¾". *Center:* Limestone female head. El Bahnassa, Egypt. Coptic period. Height 7½". *Right:* Limestone female head. El Bahnassa, Egypt. Coptic period. Height 7½".

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ARCHAEOLOGY

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editorially speaking . . .

IF PROOF WERE NEEDED that archaeology is becoming an ever more absorbing subject to an ever-growing number of people, the necessity of printing a new version of John H. Rowe's article, "Archaeology as a Career," would be sufficient. More than six years ago, in response to numerous inquiries about the prospects offered young people in the field of archaeology, we first published this article. Even before publication large quantities of reprints were ordered by institutions and individuals, to help them in guiding students, and it was soon obvious that we were entirely wrong in estimating—as we did—that a few thousand copies would satisfy the demand for a long time. Up to now no less than twenty thousand copies of this article have been distributed, and the requests do not seem to be decreasing in number. For this reason we are again printing "Archaeology as a Career," revised, expanded and brought up to date by the author, and again we are offering reprints to all those interested (see page 64 for details).

IN THE BOOK REVIEW SECTION of this issue, "Books for Beginners" include volumes which young people of various ages will find interesting and valuable, while other publications, both recent and older, are listed in Dr. Rowe's bibliography. From these books as well as from the advice offered in the article it will be clear that archaeology is not the profession for everyone, for, as Dr. Rowe suggests, it requires devotion, single-mindedness and relative indifference to material rewards. A great opportunity is offered, however, to almost everyone—to pursue this study not as a professional but as an amateur, either an "armchair archaeologist" or an actual worker in the field. Every day the amateur is becoming more and more important, as accelerating construction of dams and highways makes salvage archaeology of the greatest urgency and the professional worker finds it more and more difficult to keep up with the task. Students can gain entrance to field work by joining local archaeological organizations. There are also opportunities for work abroad, which will be described in a later issue.

A REMARKABLE EXAMPLE of what high school and even younger students can accomplish is offered by the Junior Archeological Society of Baton Rouge, Louisiana. "Knowing the Past Betters the Future" is the optimistic motto of this organization, which admits students from the sixth-grade level through high school. Already celebrating its third anniversary, the Society envisions a national organization affiliated with this pioneer group. Its program includes training in excavation, classification and museum work, the preparation of a field manual and other activities, all supervised by competent personnel. Those wishing to form a similar group may write for advice to Junior Archeological Society, 2040 S. Acadian Thruway, Baton Rouge, Louisiana.

STUDENTS INTERESTED in world-wide archaeology cannot do better than take advantage of the student membership offered by the AIA. The cost is exactly half that of the regular membership and the privileges afforded are exactly the same—a subscription to one of the Institute's publications and the opportunity to attend lectures and to keep in touch with the latest developments. Write to: ARCHAEOLOGICAL INSTITUTE OF AMERICA, 5 Washington Square North, New York 3, N. Y.



From the Heights of SARDIS

By George M. A. Hanfmann and A. Henry Detweiler

Σαρδίων ἀπ' ἀκρᾶν, "from the heights of Sardis," proudly says the ancient poet Alcman of someone who is not rustic or boorish but sophisticated and urbane; some ancients thought the poet was describing himself. These heights began to give up some of their secrets when in 1960 the Harvard-Cornell Expedition finally tackled the citadel whose precipitous flanks gave it a reputation of impregnability in antiquity. Considerable road building had to be done to enable even the donkeys with excavation supplies to ascend the least steep, southern side. Until we began our trenches, the only structure visible was the imposing Early Byzantine wall partly preserved on the central and southern heights of the acropolis (Figure 1). These, together with the heavily eroded northern peak, constitute the three major areas of the citadel. In seven weeks of taxing and sometimes perilous labor we excavated a sector on the northern slope toward the Hermus valley and opened several trenches on the central and southern heights. On the central height, a thoroughgoing upheaval during the construction of the huge By-

zantine wall (probably in the fifth century A.D.), followed by earthquakes, seems to have obliterated almost all buildings between the Lydian period (seventh and sixth centuries B.C.) and the Late Byzantine (twelfth to fourteenth century). Of the Lydian period we found only bits of walls and pockets hollowed into the conglomerate, probably the bottoms of early cisterns. Nevertheless, some precious information for the history of the fortress has been gained.

Ancient authors credited King Meles, whose rule is dated, according to modern research, in the late eighth century B.C., with the first fortifications; our earliest finds are not much later in date. Among the pottery fragments is an engaging local effort at portraying a group of animals in a lively style which is partly Geometric, partly Orientalizing, and unmistakably provincial Anatolian (Figure 2).

A spectacular object which must have been brought to the citadel not long before it fell to the onslaught of the Persians (547 B.C.) is an Attic "merrythought cup"—called thus because of the wishbone shape of the handles (not shown). Collected in dozens of fragments from a

COVER: Fragment of a terracotta relief found in Pactolus North sector. Height about 3 inches. Before 547 B.C.

EXCAVATIONS were carried on at Sardis, capital of Lydia, in 1958 and 1959 by the Fogg Museum of Harvard University and Cornell University, joined for the 1960 campaign by the Corning Museum of Glass. The project is sponsored by the American Schools of Oriental Research and financed by the participant institutions and by a grant from the Bollingen Foundation. "New Explorations at Sardis" (ARCHAEOLOGY 12 [1959] 53-61) acquainted our readers with the results of the first campaign. In the following article the directors of the expedition report on further excavations, which now include the acropolis of Sardis.



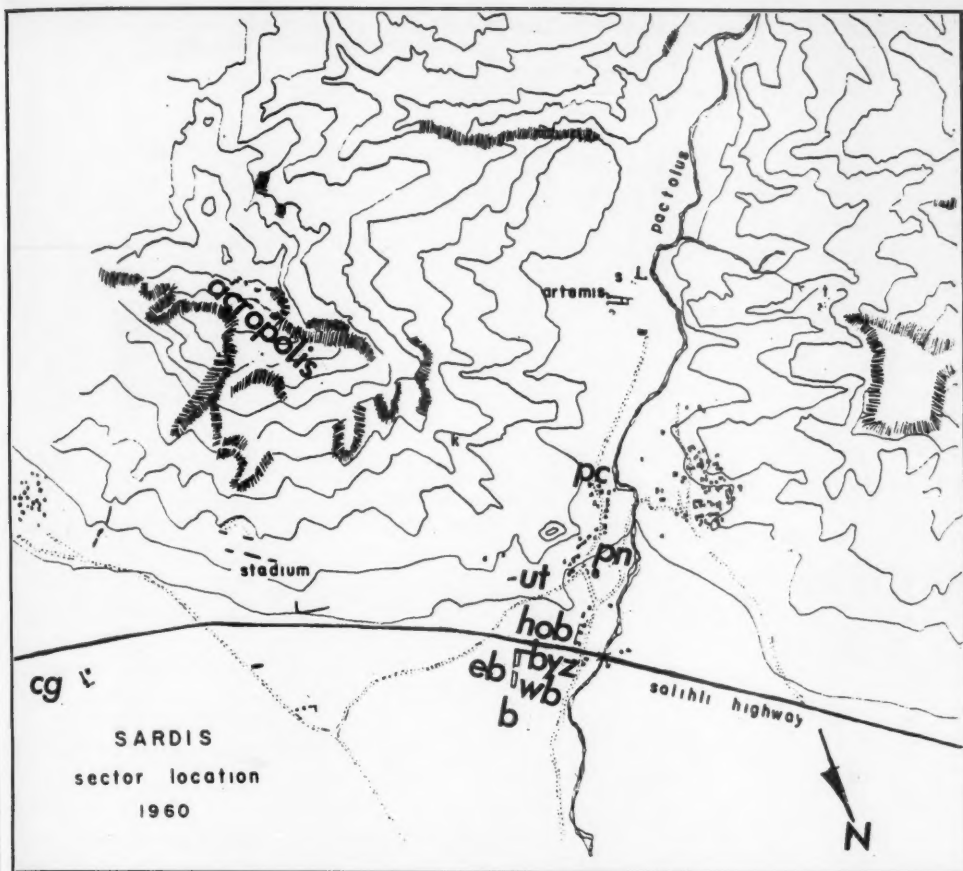
1. View of the southern slope of the acropolis of Sardis, with the Early Byzantine fortress wall. In the background is the Necropolis hill where over one thousand Lydian tombs were found by the First Sardis Expedition (1910-1914, 1922).

Sardis continued

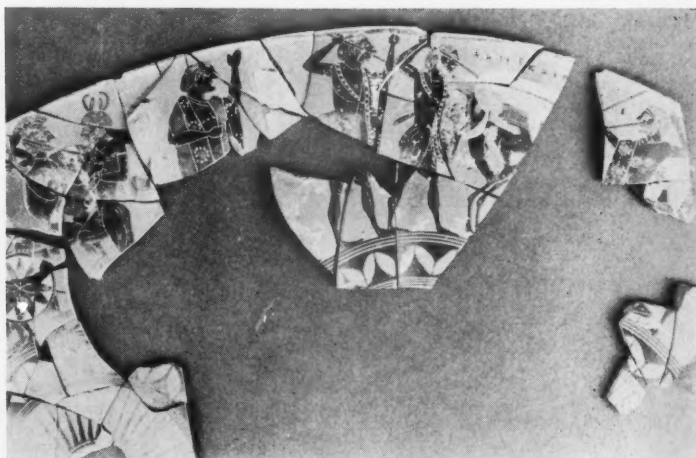
depression in the conglomerate, this masterpiece of Attic drawing (Figure 3) depicts the legendary boar hunt at Calydon and a battle scene which is Homeric in spirit, though not closely identifiable. Arrowheads found on the acropolis of Sardis (Figure 4) are identical in type with those which proved the undoing of the Lydian garrison at Gordion four hundred miles to the east. Nothing awakens so vividly the sensation of the irresistible advance of the Persian archers across Asia Minor as these mute witnesses to the last stand of King Croesus. Another venerable relic of the time of Croesus or that of his father Alyattes was found in a Byzantine cistern—part of a marble lion carved in a form intermediate between sculpture in the round and relief (Figure 5). This fragmentary piece is shown by its cuttings to have formed the side of a marble throne, either that of Cybele, the great goddess of Sardis, who had lions as constant companions,

or of a Lydian king or nobleman, for the lion was the emblem of the royal house of Lydia.

SHORTLY BEFORE THE START of the excavations of 1960, a scouting party from our expedition came upon a few stone blocks which had become visible on the north slope of the citadel after peasants or shepherds burned down the underbrush. Upon excavation, the stones turned out to belong to a beautifully cut marble wall, part of the corner tower of a Hellenistic fortification system which was hitherto quite unknown (Figure 6). This tower, located just a little below the highest peak of the acropolis, commands magnificent views up and down the Hermus valley. A coin of Antiochus III (223-187 B.C.) from the foundation trench of the tower provides an approximate date for its construction. It reminds us, too, of one of the dramatic episodes in the history of Sardis (described by Polybius) when this great king of Syria was besieging the pretender Achaëus. After a clever feint against the



MAP SHOWING AREAS OF EXCAVATION AT SARDIS, 1938-1960.



2. Left: Terracotta plaque found on the central platform of the acropolis. Painted in black and red on white ground, it shows two goats and a bird floating in air, while a lion (fragmentary) stalks to left. The other side of the plaque has a checkerboard pattern. Length slightly more than 2 inches. Seventh century B.C.

3. Right: Attic black-figure cup from the acropolis. The fragments shown depict part of a battle scene (left) and of the Calydonian boar hunt. Over the boar the inscription Χαίρε καὶ (ie ev), "Rejoice and drink well." Ca. 560-550 B.C.



4. Bronze arrowheads from the acropolis of Sardis. The longer one measures about 1½ inches.



5. Fragment of a lion, part of a marble throne. The figure is fully rounded but the background is not cut away; the effect is that of a two-sided relief. The lion supported the seat and arm of the throne, which were inserted into cuttings on top. Height ca. 17 inches. First half of the sixth century B.C.



6. Above: The Hellenistic marble tower, and (on the right) the beginning of the Persian (?) sandstone wall, parts of the defensive system on the north slope of the citadel. In the background is the Hermus plain.

7. Right: Bronze boar in relief, found on the north slope of the acropolis. A cutting at the top and two loops projecting from the back suggest that the relief was to be fastened to a piece of furniture or to a utensil. Length nearly 4 inches. Archaic Greek, sixth century B.C.



Sardis continued

"Persian Gate" (as yet undiscovered), the troops of Antiochus climbed across the city wall above the theater, in an area just below the tower which we have discovered. The citadel itself was finally starved out. By building this new tower, Antiochus may have tried to correct what he himself had proved a weakness in the defenses of the citadel.

A wall of green sandstone abuts on the tower at the west. There is some reason to think that it belongs to an earlier Persian fortification, part of the triple enceinte which Alexander the Great saw when he ascended the acropolis in 334 B.C. Unfortunately, both marble tower and limestone wall peter out against the conglomerate of the acropolis—the immediate continuation of these defenses must have fallen down the hill, as had the earlier Lydian structure. In the fallen debris just below the Hellenistic tower there appeared a fine Greek bronze relief of the Archaic period, depicting a boar (Figure 7).

Nearly one thousand feet below, valuable information about the Lydian and the Persian city is being unearthed in three sectors around the foot of the acropolis in the areas south of the modern highway, and in two sectors on the east bank of the Pactolus River, called Pactolus North (PN on plan, ca. 200 m. south of the highway) and Pactolus Cliff (PC on plan, ca. 200 m. farther south).

In the sector of the House of Bronzes (HOB on plan), where we first came upon Lydian strata in 1958, we discovered a sizable area which had not been built over in Hellenistic or Roman times. A long wall and a number of small rectangular structures seem to indicate a commercial district which flourished from the early seventh century to about 500 B.C. Large piles of pottery and a heap of Lydian lamps are representative of the products that may have been sold in these shops.

Exciting prospects for illuminating the history and prehistory of Sardis are suggested by results obtained in a sounding south of the House of Bronzes which we dug to a depth of some thirty feet below the present surface. Interspersed by large water-laid deposits there appeared a continuous sequence of earth floors. Traces of fire were found over one of the floors near the top (ca. 700 B.C.) and over another (ca. 1200 B.C.?) near the bottom of the pit. The sherds collected from the various floors represent a culture which is definitely Anatolian, but throughout the whole sequence there is a small but steady trickle of imports from Greece. Only a few large, distinctive Greek sherds occurred in each level; they reflect contacts extending from the Late Geometric of the eighth century B.C. through Ripe Geometric back to the Submycenaean and Late Mycenaean periods of the Bronze Age. According to Herodotus, the "sons of Heracles"

seized power in Lydia after the fall of Troy (now often dated ca. 1240 B.C.) and 505 years before the ascent of the historic royal house of the Mermnadae (687 B.C.), that is, around 1192. It is tempting to speculate that the thorough burning of the area in the thirteenth century B.C. may have something to do with the coming of this dynasty. Another, perhaps even more interesting, possibility is that the destruction was inflicted upon Sardis by the great campaign of the Hittite King Tudhaliyas IV (1250-1220 B.C.). From Hittite archives we know that he defeated the country called Assuva, a name perpetuated in our name of the continent of Asia; scholars have generally accepted H. Th. Bossert's suggestion that the name must have originated in the Bronze Age and that Herodotus (IV.45) was right when he connected "Asia" with the name of a tribe "Asias" still known in his day at Sardis. Sardis, then, was the capital or at least a center of the country Assuva. Assuva was the leader of a great coalition reaching from Lycia perhaps as far as the Troad; and the British historian George L. Huxley has just proffered the attractive hypothesis that the defeat of this alliance enabled the Greeks to attack Troy (*Achaean and Hittites* [Oxford 1960]). Historical issues of the highest interest are thus raised by this pit, so far comparatively small. We shall have to enlarge the excavation before we can decide upon the correct interpretation.

IN THE SECTOR Pactolus Cliff (opened in 1959), a succession of periods was represented. A Late Roman villa with mosaic floors was found overlying Roman graves and a Hellenistic chamber tomb (called Tomb of the Lintel) which yielded attractive vases and terracottas. In two seasons' digging, four strata of Lydian buildings were differentiated under the later walls. Penetrating farther down, we encountered only sterile sand until the water level of the Pactolus torrent was reached. In contrast to the small structures of the House of Bronzes area, the Lydian buildings in this Pactolus Cliff sector were of substantial size. One of the walls preserved was thirty-five feet (11 meters) long. All of the major walls were found to continue into the unexcavated banks of the trench, the size of which had to be confined to avoid infringing upon courtyards of modern houses. Thus no complete plan of a building was retrieved. The highest Lydian level may have perished when the rebellious Ionians captured and burned Sardis in 499 B.C. The second level yielded much Lydian and Greek pottery, including fragments of an attractive bichrome bowl (perhaps Ephesian) with floral designs (Figure 8); this level dates in the second half of the seventh century B.C. The structure associated with it may have had a megaron-like, oblong plan. In the third level (Figure 9) we seem to discern a street bounded by the wall of one long struc-

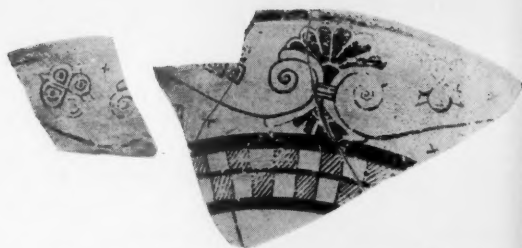
Sardis continued

ture on the south side and a building with a curious double wall on the north side. Finds of Greek Geometric pottery prove that these structures were in use in the late eighth century B.C., but it is as yet impossible to be certain how much earlier they were built. This period saw the flowering of the Lydian Protogeometric-Geometric style of pottery, distinguished by the use of circles and half-circles (Figure 10) and wavy vertical lines arranged in a metope-like pattern executed in black paint on a red background or in brown on buff.

Of the lowest level only two isolated walls survive; a black monochrome sherd from this level displays a curious incised design of a mountain and a thunderbolt. Technique and decoration are suggestive of the Bronze Age; another sherd, however, with geometric designs painted in black and red on a white ground, seems to resemble the pottery of Iron Age Phrygia.

The buildings of the second and third Lydian levels may have been sanctuaries; a peculiar feature is the frequent occurrence of bowls with a central boss (*omphalos*) and of large storage vases, some of the latter incised with various signs. Whether these are decoration or potters' marks or an unknown kind of writing is not as yet determined.

The excavation at Pactolus North (PN) has not penetrated deeply into the Lydian strata, though small soundings indicate that the earlier Lydian phase (seventh and eighth centuries B.C.) is represented. Two destruction levels clearly mark two major events of Lydian history—the capture of Sardis by Cyrus in 547 B.C. and the burning of the city by the Ionians in 499. From the debris of the buildings destroyed by Cyrus' Persians came the striking portrait of a Lydian reproduced on the cover of this issue. White-skinned like a woman, wearing earrings, clad in a gorgeous purple robe, this bearded dandy well illustrates the "useless luxuries" which the Ionian Greeks were said to have learned from the Lydians.



8. Fragments of East Greek plate with floral Orientalizing design (second Lydian level, PC). Seventh century B.C.

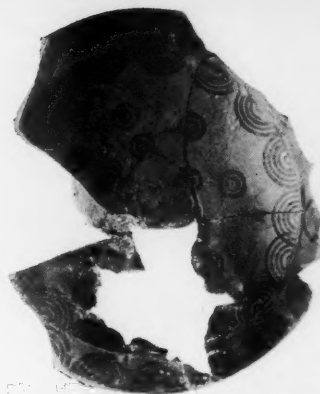
Much interesting pottery was found in the level that intervened between 547 and 499 B.C., but the major interest of this sector lies in the discovery of a monumental structure from the Achaemenid era, when Sardis was capital of the most important Persian satrapy in the West. Built after 499 in more careful technique than the earlier Lydian walls and preserved up to a height of six feet, this structure features two apsidal units separated by a corridor or alley. The Pactolus River has torn off the outer sections of the apsidal units and their continuation to the west remains to be investigated, but the intriguing design bespeaks a building of some importance—either a fort defending the Pactolus crossing or a residential complex. Here again a Roman villa with mosaic floors was built about A.D. 400 directly upon the earlier walls.

Herodotus says that at the time of the Ionian rebellion the Pactolus flowed right through the agora, the civic center of Sardis. It is not impossible that our excavations in the region of the House of Bronzes have led us to the commercial, bazaar-like fringe of the agora, while the structures in the Pactolus North trench may well be located near the center of the agora. This hypothesis, too, will be tested in future campaigns.

THE WESTERN PART of the Roman and Early Byzantine city is being investigated in a sizable area some 600 yards (500 meters) long and over 200 yards wide. On the south side the city wall, disrupted by robbing of stones in mediaeval and modern times, climbs a ridge toward the summit of the acropolis. One stretch of it (UT) was tested in 1959 and proved to date from the late fourth or the fifth century A.D. Part of a terraced construction of the Roman era was uncovered on the slope which descends toward the House of Bronzes (Figure 11). Another sizable Roman structure was partly excavated in 1960. Like the House of Bronzes, these perished in the onslaught of the Sasanian Persians between A.D. 615 and 617. The exploration of this *zona monumentale* has brought all sorts of surprises. Thus,



9. Lydian buildings in the eastern bank of the Pactolus (Sector PC). Parts of two large buildings of the third Lydian level are shown; at upper left and center is a row of stones of the lowest (fourth) level.



10. Fragmentary Lydian plate with black on red decoration. Diameter ca. 12 inches. Eighth century B.C. or earlier.



11. View of the area of the House of Bronzes (foreground) and the gymnasium complex (B) from the south. In the left foreground is the Lydian commercial area; in the center is the long wall of the Roman structure.



12. Part of the Marble Court which served as an entrance to the gymnasium building (right). The triple gate was blocked up in Byzantine times.

Sardis continued

within the Roman structure there were found the skeletons of four men heaped up on top of a grave which contained still another skeleton. All of these had been deposited after the structure ceased to serve its original function. Another unexplained mystery concerns the appearance in 1959, only a foot or so below the surface of the field, of two Roman marble statues portraying husband and wife, lying foot to foot. Somebody went to the trouble of depositing them in this manner long after the House of Bronzes—not only of the Roman but also the Early Byzantine period—had ceased to exist.

More has been learned about the House of Bronzes since the first report on it appeared in *ARCHAEOLOGY*. An important unit, a marble paved court, has produced rich finds of Early Byzantine bronze utensils and glass; and coins found under the latest floors—probably just before the Persian invasion of A.D. 615—make it certain that the house was inhabited in the sixth and early seventh century. The date of its construction is not yet precisely known.

That Sardis had an important glass industry during the Early Byzantine era is one of the conclusions of the study undertaken in cooperation with the Corning Museum of Glass. Most of the material has come from the long row of Early Byzantine shops which lie to the south just across the highway from the House of Bronzes area (**BYZ** on plan). It is now known that these shops extend for at least one hundred yards, presumably along the city's

east-west artery. A public latrine was attached to this shopping center.

The plan of the vast complex of a Roman gymnasium is gradually emerging (**B, EB, WB** on plan). Its over-all design featured a large colonnaded court on the east, from which a smaller court, known as the Marble Court (Figure 12), led into the central hall of building **B**. The smaller court was flanked by units which had exedrae and shorter colonnades. The long building **B** and these units to the east were built in the second century A.D. with a system of limestone piers, walls of rubble and brick, and brick vaults and arches. Early in the third century the Marble Court received luxurious and elaborate façades "from the foundations up," according to the fragments of the monumental dedicatory inscription (Figure 13). The inscription honors the empress Julia Domna and two emperors; the name of one of them is erased and it is certain that they are Caracalla and Geta, Geta's name having been erased after he was murdered by Caracalla's command in A.D. 212. The architectural elements have been tumbled into wild disorder by an earthquake, but the elaborate entablatures, spirally fluted columns and arched pediment over the central gate bid fair to reveal a major example of Severan baroque. Even finer, perhaps, was the architectural decoration of the second century, to judge from the column capitals adorned with heads of mythological figures (Figure 14); the best of them, the laughing faun, has already been illustrated in *ARCHAEOLOGY* (12 [1959] 284). Fragments of architectural sculpture, perhaps of the late third century, indicate that various replacements may have been made at a later date. During the Early Byzantine period the entire gymnasium complex became part of the city's defensive system. What structural changes were made within it is not yet clear, but in 1960 we discovered fragments of a long Byzantine inscription which ran on the faces of the piers all around the marble court, apparently in commemoration of some repair or reconstruction.



13. Part of the dedicatory inscription honoring Julia Domna, Caracalla and Geta, which originally formed part of the entablature over the triple gate of the Marble Court.

West of the central unit B is a complex with large marble piers, but this is still insufficiently known for us to be certain either of its plan or its date. The general layout of the gymnasium complex recalls the symmetrical designs of the great gymnasia of Ephesus.

FAR TO THE EAST, beyond the Early Byzantine city wall, lies the complex CG, deeply buried by flood deposits of a torrent. A major effort to reach the foundations of its southern part ran into the water table some thirty-five feet below the highest preserved point of the structure. We have ascertained, however, that what we described previously as the eastern and western structures are parts of one vast hall which was spanned by a masonry arch at its southern end, and possibly by a masonry vault. Plan and methods of construction are similar to those of the halls in the bathing establishments of Hierapolis in Phrygia. That this building was used as a bathing establishment in its second phase became certain when we found a typical Roman furnace and heating chamber of brick, which had been built under the lower arch of the limestone structure.

In this, the second phase, a great extension in rubble and brick was added on to the northern end of the limestone structure; it includes a circular unit and several halls to the north and east. This extension features a plethora of arches which led us to nickname CG "the arch factory." About A.D. 400 or shortly thereafter, a new system of brick walls was built into the pre-existing rubble units, and here the "arch craze" reached its culmination, with arches used to support arches. Because the complex was silted up rapidly, its architectural features are unusually well preserved and stand to a great height. Last summer, fragments of wall decoration were discovered *in situ*; although incomplete and (so far) confined to ornamental motifs, they present us with rare Early Byzantine (fifth or sixth century) mural decoration from a secular structure. The unit was already deeply

buried when Middle Byzantine craftsmen (tenth century) established themselves briefly in the ruin.

This was the last flicker of prosperity for Sardis, the time, too, when the last effort was made to repair the defences of the acropolis. Some attractive glazed pottery was made, and this craft continued, though on a declining level. The last structures on the acropolis are poor, disjointed walls thrown together hastily out of any stone or brick at hand. The latest coins we found are Islamic, some of them of the kingdom of Sarukhan (fourteenth century), struck after the Byzantines were forced to surrender the citadel to the Turks. Then came Tamerlane's disastrous invasion (1402), and for several centuries thereafter only shepherds and an occasional hardy explorer disturbed the Egyptian vultures planing through the sky over the heights of Sardis.



14. Head of a mythological figure found in the Marble Court of the gymnasium complex. Height ca. 10 inches. Roman, second or third century A.D.

A Private House Discovered at MYCENAE

By Nicholas M. Verdels

AFTER THE DISCOVERY of the royal palace and the almost complete investigation of the acropolis as well as the royal tombs, the most interesting excavation which Mycenae can offer is that of the private houses of the lower city. Owing to the character of the terrain, there was not one residential quarter but a number of them. Those near the acropolis were inhabited by the well-to-do residents, and it is in this area that the house we are about to describe was found.

In the spring of 1958, during the widening of the modern road to Mycenae, foundations of a building came to light on the west side of the road adjoining the area where Professor Wace discovered the building which he called the House of the Oil Merchant (ARCHAEOLOGY 6 [1953] 75-81). I immediately undertook its excavation and uncovered the western section of a large Mycenaean house.

Since the eastern section of the house was covered by the road, it was necessary to move the latter farther to the west. After this had been done it was possible to excavate the whole house, which was almost entirely cleared during the summer of 1959.

This newly discovered house was at first thought to be part of the House of the Oil Merchant. However, it is now sure that these are two separate houses, as no contact between them has been discovered. The line of the north wall of the Oil Merchant's house is extended to—but does not bond in with—the east wall of the new house by a retaining wall which supports the artificial fill of the passage separating the two houses. This also indicates that the House of the Oil Merchant was built after the recently discovered house, a chronological se-

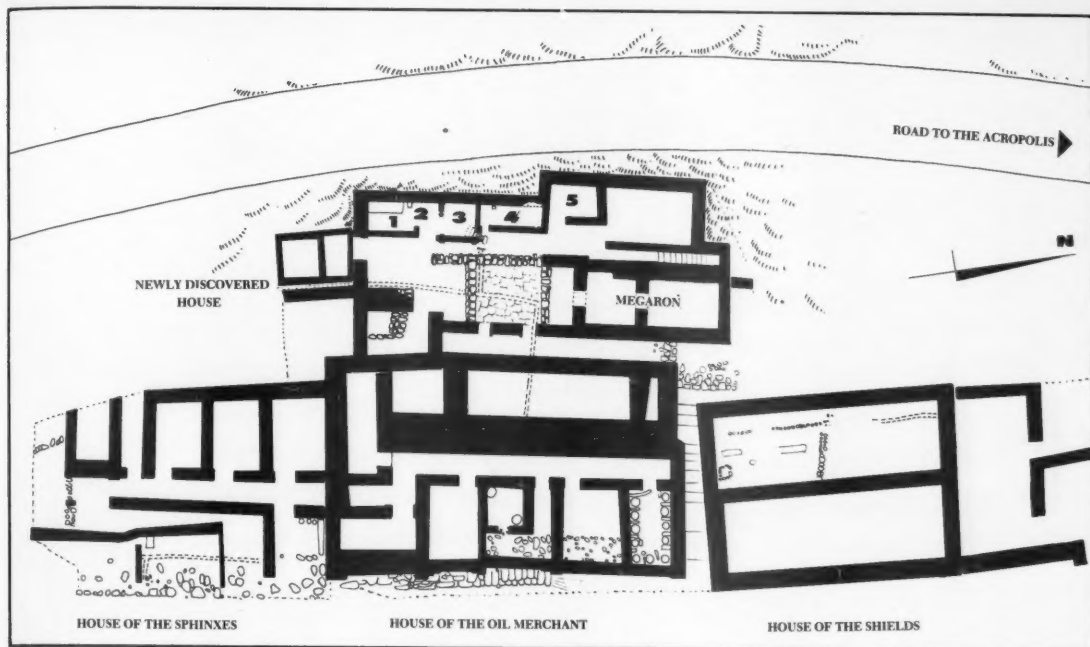
quence which is also substantiated by other evidence.

Like the houses excavated by Professor Wace, this too was destroyed by fire and at the same time. The obvious traces of fire give the impression of a sudden calamity. They were particularly marked in the three rooms at the south end of the western section, where there was a pile of debris consisting of burned and calcined stones mixed with mud brick which had been baked hard and reduced to a shapeless mass; under this lay a thick layer of pure ash. In the eastern section of the house, however, the accumulated fill was shallow and the foundations of later buildings had been carried down almost to bedrock. Here the finds were few, consisting only of small sherds, while the foundations of the Mycenaean house were found to be considerably damaged, with only the lower courses preserved.

This house, like other Mycenaean houses, includes living rooms, reception rooms and a domestic quarter. The former occupy the front section of the house, adjoining the passage between this and the House of the Oil Merchant, while the domestic quarter lies at the back of the house to the west.

Two large adjoining rooms, extending north to south, form the northeastern corner of the house. South of them is a third, narrower room. The doorways and other details have not been preserved because of great damage here, but it is clear that we are dealing with a *megaron* type, as usual divided into a portico (*aethousa*), hall (*prodomos*) and *megaron* (*domos*).

During a later period the site of this *megaron* must have been used for religious purposes, for near the southwest corner of the *prodomos* were found a few



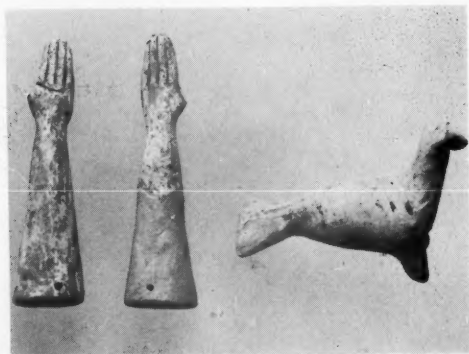
Plan showing private houses excavated at Mycenae. Drawn by T. Kritharas.



General view of the house from the south. At the left is the domestic quarter, and above it can be seen the modern road.



Figurines found on the site of the megaron. These are of the Archaic period, several centuries later than the house foundations.





Left: Tablet inscribed in Linear B script, found in the house.

Below: Mycenaean vases found in Room 1 of the domestic quarter.



Private House continued

Archaic figurines and some very small vases whose religious character is clear.

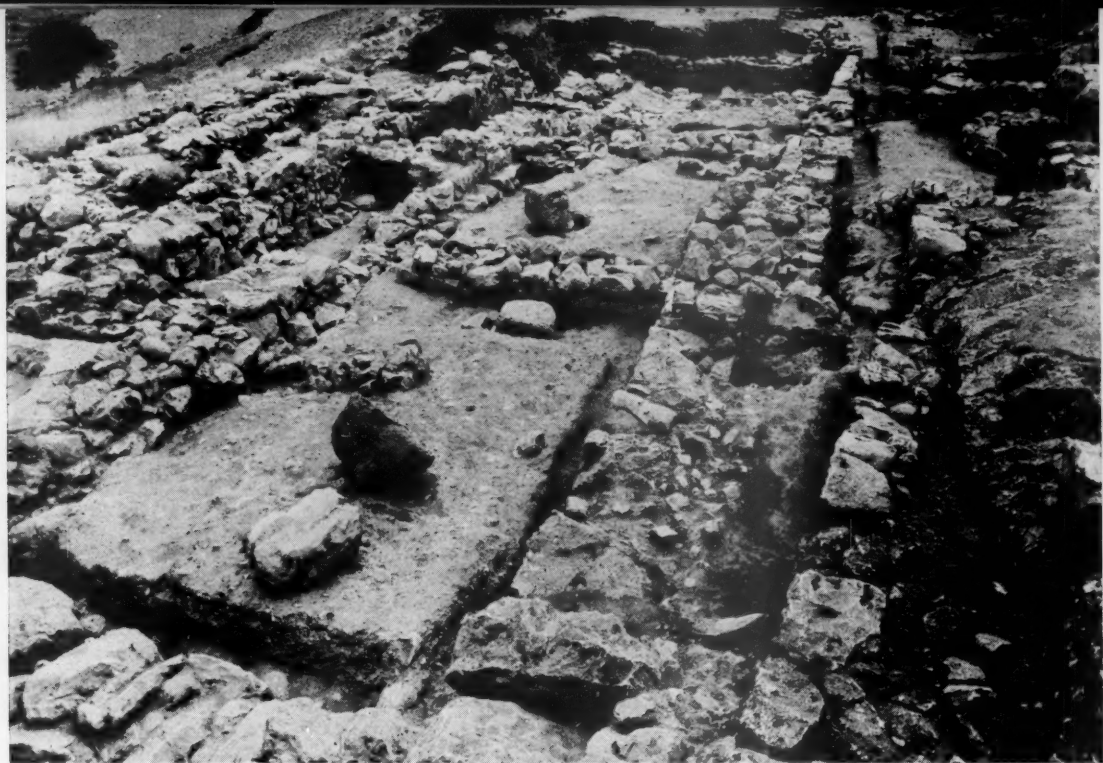
In front of the megaron complex is a large court paved with stone slabs. To this, it seems, the main entrance of the house leads from the passage between it and the House of the Oil Merchant. The court also communicated with the domestic quarter west of it. Probably there was another entrance in the western wall of the hall or of the portico which led directly to the domestic quarter, but this is not preserved.

South of the court are other rooms, the plan of which is not yet clear. In this section of the house a second story must have existed, to judge from a paving of stone slabs which was apparently the base for a staircase. There was probably another stairway west of the megaron leading to the upper floor.

The domestic quarter, at the back of the house, contained five rooms in front of which ran a long corridor. Wood and mud brick, above rubble foundations, were used for the superstructure of this house, as in others.

This is proved by the fragments of plaster with triangular indentations showing impressions of wooden beams which were found in the first room (1 on plan). There is also definite evidence for the use of wooden doorposts and thresholds.

Rooms 1 and 3 were entered through Room 2, which served as an antechamber. The walls of these three rooms, like those to the north, are plastered, and the floors paved with whitish clay. In the southwest corner of Room 1 a low shelf was formed by a slight elevation of the floor. On this vases or inscribed tablets had doubtless been set, for a whole tablet in the Linear B script and fifteen fragments of others were found beside it. Still another fragment of a tablet was found near the doorway of the middle room (2), while two others (one complete but badly damaged) were found immediately under the surface soil at the southwest corner of Room 5. In Room 1, in addition to the tablets, there were numerous fragments of small vases, notably stirrup jars. In the middle of the room, under a heap of debris, lay ten more whole stirrup jars, all belonging to the Late Helladic III B period (1340-1210 B.C.).



The megaron of the house, as it appears from the north.



Inscribed stirrup jar, Late Helladic III B, found in the domestic quarter.

Private House continued

Inside a flimsy stone enclosure in Room 2 lay two large undecorated kraters (mixing bowls), one above the other. Both were filled with whitish clay; perhaps this was used for making stoppers for the large stirrup jars or for repairs to the floor plaster.

In the northeast corner of Room 3 there is a small opening, and behind this was found a hearth, beside the entrance to the adjoining room (4). In the eastern doorpost, in a hole filled with black ash, were found traces of wood. Inside the room we found fragments of a large pithos, or storage jar.

Room 4 is longer and narrower than the first three rooms. Only half of the western side is built of stones, the north half is formed by the native rock, while the east wall is irregular and seems to have been reconstructed at some later time. In the middle of the room we found two large undecorated amphorae, one of which was filled with a kind of small peas. The presence of these household pots shows that the room was used as a kitchen.

In the northernmost room (5) the rock was cut down to form the west and north sides. It was then covered with a thick layer of mud and a plaster facing. To the left of the doorway is a well which had been filled to the top during the Hellenistic period and used as a grave. In



Large drain running through the paved court of the house.

the room we found many *kylikes* (drinking cups) and a large stirrup jar bearing an inscription.

At the north end of the western section of the house is an almost square area, the floor of which is formed by bedrock leveled off one meter higher than the floor of the adjoining rooms. The reason for this is not known. At the east end of the north side of this area we found remains of a floor covered with lime cement, and the rock that forms the side wall was similarly covered.

A notable feature of this house is its two drains. One runs eastward across the middle of the northern room of the megaron (*domos*) and has its outlet at the base of the terrace wall, at the west end of the street running between the House of the Oil Merchant and the House of Shields. The second begins at the south, at a structure which may be a bathroom, links up with a branch running in line with the entrance to the kitchen and crosses the paved court to run alongside the external foundation of the porch of the megaron and out beneath the passage and the House of the Oil Merchant. Where it ended is not yet certain. This drain is very well constructed, and the floor slopes gradually toward the outlet. The upper section of the drain is paved with slabs, while nearer the outlet it is cut out of the rock. The continuation of the drain beneath the House of the Oil Merchant is the most convincing proof of the difference in date between the two houses. In the drain were found numerous cook-

ing pots of Mycenaean date with a layer of dirty encrustation on the surface.

Various Hellenistic graves were found throughout the eastern section of the house. One lay in the drain and two others beside it to the south. This later disturbance makes the interpretation of this area most complicated, and further study is necessary to elucidate it.

The evidence furnished by this house confirms two observations of Professor Wace. First, that the houses in this area, opposite the royal palace on the citadel, were private dwellings belonging to the wealthier inhabitants. Foundations discovered elsewhere in the area during the construction of the new road indicate, moreover, that the whole slope was occupied by similar buildings. Secondly, the rich finds in this elaborate house of ample proportions built outside the citadel wall are an added proof of his contention that safety and peace reigned in the Mycenaean state at that period.

THE AUTHOR, who holds the Ph.D. degree from the University of Athens, is currently Ephor of Antiquities for the Argolid and Corinthia. He has previously held posts in Athens and in Thessaly. Among Dr. Verdelis' many investigations may be noted his important excavations at Pharsalus (Thessaly), at Galataki (Corinthia), at Tiryns, and particularly at the Corinth Canal, where he has uncovered a large portion of the *diolkos*, the ancient portage route. Most recently Dr. Verdelis has been excavating at Dendra (Argolid) in cooperation with the Swedish Archaeological Institute.

THE RECORD OF TIME

IT FREQUENTLY HAPPENS in science that those phenomena which upon first examination appear to be the most complex and bewildering turn out in reality to be governed by surprisingly simple rules. In the case of the weathering of ancient glass, a rather complicated problem from the chemical point of view, the recent discovery of one of the simple rules governing the weathering process has led to the development of a new method for the dating of archaeological remains. This method, based on the microscopic examination of weathering crusts, has been shown to be valid for the dating of certain glass objects from the American Colonial period, and there are promising indications that it will also be useful for dating objects from more ancient sources.

The technique does not yield the date of manufacture or of use, but rather the date at which the glass object was first buried, whether intentionally, as in a grave, or by some chance. It is hoped that this method may provide the archaeologist with an accurate tool for dating contexts in which fragments of weathered glass are found. The experimental procedures involved are quick, straightforward and inexpensive. Although the method is destructive, only small samples are needed and the most undistinguished fragment of glass is every bit as suitable for dating as are complete and valuable objects.

In order fully to understand the method it is necessary to discuss the nature of the weathering process, the causes of the layered structure observed in weathering crusts, the results of the experiments confirming the dating procedure, and finally the limitations of the method.

WHEN OBJECTS of glass have been buried in the earth or submerged in water for long periods of time, they often undergo a slow chemical deterioration which results in their being covered with crusts of weathering products. The appearance of such objects is not unlike that of corroded metals, although chemically the two corrosion processes are quite dissimilar. This decomposition depends principally upon the action of water which leaches out, or dissolves, the more soluble ingredients from the glass and leaves behind a residue consisting almost entirely of silica. The deterioration starts at the surface and proceeds into the glass, so that the outer surface of the weathering crust coincides with what was initially the outer surface of the glass itself.

There is really a remarkable variability in the weathering crusts found on different objects. They differ in color, texture and mechanical strength. The outer surface

may be glassy or dull, hard or soft; the crusts may adhere tightly to the body of the undecomposed glass or they may be so fragile that the lightest touch of the finger will cause them to crumble. Despite these differences, which are caused by differences in the burial environment and in the chemical composition of the glasses, there is one particularly interesting feature which most crusts have in common. Almost invariably they have a laminar, or stratified, structure, that is, the crusts consist of many very thin layers stacked upon one another. The individual layers are so thin that they cannot be seen even with a good hand lens, but when the crusts are viewed in cross-section through a microscope the layers stand out clearly. The photograph at the upper right on page 19 shows a cross-section of a typical weathering crust at high magnification. The dark vertical band in the center of the picture is a human hair which was placed on top of the layers before the photomicrograph was taken, in order to illustrate the minute scale of sizes involved.

That weathering crusts have a stratified structure has been known for nearly a hundred years, and this knowledge has supplied us with a satisfactory explanation of iridescence phenomena which so often appear when part of a crust is removed. Actually, however, no really adequate explanation was given during this time to account for the formation of the layered structures.

Recently, from this rather complicated picture has emerged the fact that there is a definite relationship between the number of individual layers within the weathering crusts of archaeological specimens and the length of time of burial. The relationship seems to be a very simple one—for each year that the object has been buried in soil or submerged in water one individual decomposition layer is formed. It seems, therefore, that by counting the number of individual layers within a weathering crust it should be possible to determine for how many years an object has been buried or submerged. This technique is analogous to counting rings within a tree trunk to determine its age, except that a destructive process is involved rather than a process of growth.

The validity of this counting technique was established by examining weathering crusts removed from objects which had been buried or submerged for known periods of time. Small samples were mounted in plastic, sawed across to expose a cross-section of the weathering crusts, then ground and polished. The layers in each sample were counted by means of microscopic examination. The samples used are described on page 21, and the results

E

IN WEATHERED GLASS

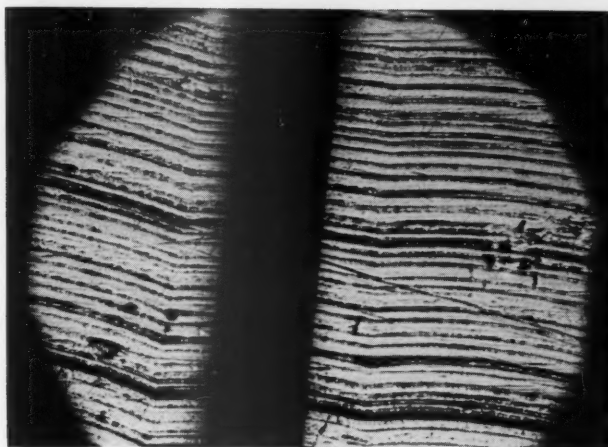
By Robert H. Brill



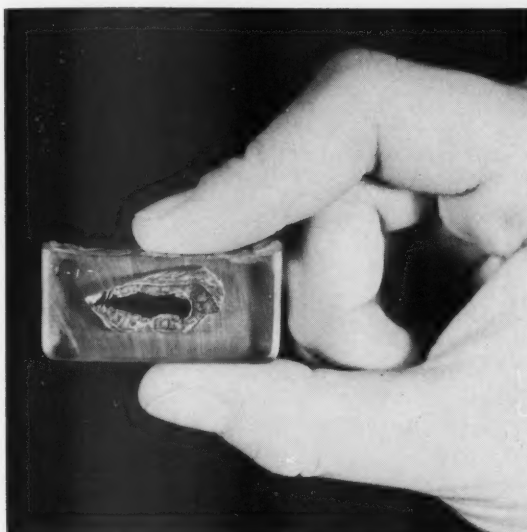
Top of a Dutch gin bottle (J-2 in table) recovered from a well in Jamestown, Virginia. The bottle has been dated 1600-1640 on the basis of its style and of objects found with it. The counting technique indicates that it was submerged in 1646, plus or minus ten years.



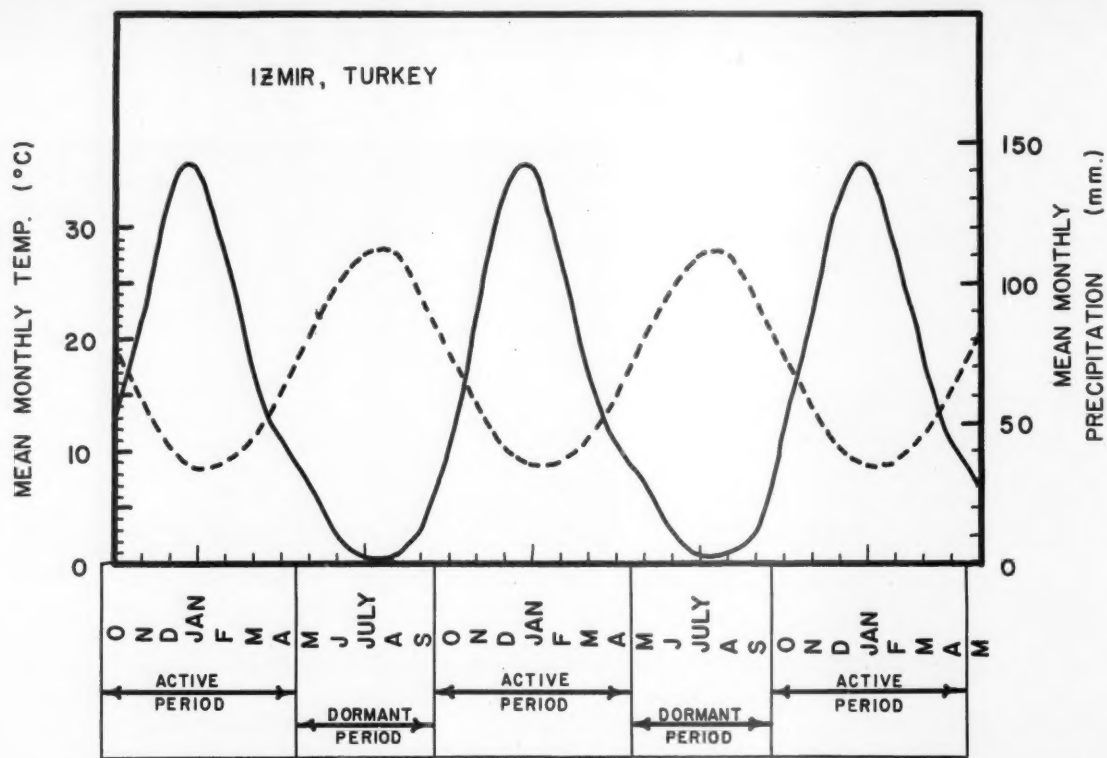
Glass fragment (about 3 cm. in length) from the base of a wine bottle salvaged at Port Royal, Jamaica. It was submerged in 1692, when an earthquake caused part of the city to slip beneath the sea. During 267 years of submersion the corrosion penetrated the glass, leaving a weathering crust about 2 mm. thick. The counting method yielded a possible range of dates from 1685 to 1701, with a most probable date of 1691.



Photomicrograph showing the layered structure exposed when a weathering crust on a glass object is viewed in cross-section. The dark central band is a human hair placed across the layers to show the scale of sizes. By counting the layers it is possible to determine for how many years the object has been buried. Approximate magnification: 350 times.



Heavily weathered glass fragment (S-1b in table) excavated at Sardis in 1960. The piece has been encased in plastic and cut so as to expose a cross-section of the weathering crust. The dark central portion is undecomposed glass. It is believed that the fragment was buried some time between the late third and the early seventh century. When examined under the microscope the crust was found to consist of about 1582 layers, indicating a burial date of about A.D. 378.



Graph showing the mean monthly temperature and precipitation for Izmir, Turkey. This is a composite graph based on data collected over the past twenty years (United States Weather Bureau, *World Weather Records* [1941-1950] and *Monthly Climatic Data for the World* [1959-1960]). During the active periods weathering is believed to occur, while during the dormant periods the weathering products are believed to compact into a separate, clearly defined layer.

Weathered Glass continued

of the counting experiments are shown in the table on the same page.

As an example consider sample J-5, the first piece on the list. It was taken from the base of a wine bottle recovered from a British ship sunk in the York River in 1781 during the siege of Yorktown. Numerous independent counts indicated an average and most probable value of 156 layers. Because of the fragility of the material being studied the layers occasionally become mashed together and damaged, so that it is not always possible to tell exactly where one layer begins and another one ends. Therefore there are errors in the counting operation. By allowing for errors it was estimated that the maximum number of layers that could possibly be present in this case was 170, while the minimum number pos-

sible was 150. At any rate, if 156 (the number of layers counted) is subtracted from 1935, the year in which the piece was excavated, a submersion date of 1779 is obtained, in good agreement with the known date of 1781. The two-year variation is well within the experimental margin for error. Similar calculations for the samples on the table through SA-2 are equally convincing in showing that the hypothesis of a yearly decomposition schedule may be accepted for these Colonial glasses.

Unfortunately, during the early stages of this investigation there were not many well dated pieces of ancient origin immediately available—at least not many with intact weathering crusts, and so preliminary work was conducted on three samples from Nishapur and one from

DESCRIPTION OF SAMPLES

The samples designated with the letter J in this table were supplied by Mr. J. Paul Hudson, Museum Curator at Colonial National Historical Park, Jamestown, Virginia. His descriptions of the samples follow:

J-5. Base from English wine bottle, 1775-1781 period. Found inside the hull of a British ship at the bottom of the York River, offshore from Yorktown, Virginia, in 1935. The ship was sunk during the siege of Yorktown in 1781. J-4. Small piece of window glass from the First State House at Jamestown, Virginia, built about 1639, burned or razed about 1670. The fragment was found in damp soil in 1935. It had probably been buried about 1670. J-6. Neck fragment from an English wine bottle of the 1660-1675 period. Unearthed in damp soil near a brick foundation of a Jamestown house, 1650-1675 period. J-2. Fragment from a Dutch gin or spirit bottle. Found in water in a Jamestown well in 1956, in association with artifacts of the 1600-1640 period.

Pl-1 is a fragment of a small medicine bottle of the sort in common use during the seventeenth century. It was uncovered during the excavation of the site of the Joseph Howland House at Rocky Nook, Kingston, Massachusetts, in 1959. Mr. Harry Schnabel, Supervisor of Archaeology at Plimoth Plantation in Plymouth, Massachusetts, has associated the west cellar of this building, where the fragment was found, with a period of occupation beginning in 1676. PR-5 was taken from the neck of a wine bottle recovered during a dredging operation in 1959 at Port Royal. Mr. C. Bernard Lewis, Director of the Institute of Jamaica in Kingston, Jamaica, supplied this bottle, which has been presumed to have been submerged since

Sample	Date based on archaeological evidence	Excavation date	Layers counted	Date calculated for onset of weathering
J-5	Submerged 1781	1935	150-156-170	1765-1779-1785
J-4	Buried 1639-1670	1935	256-266-273	1662-1669-1679
J-6	Buried ca. 1660-1675	1935	261-271-286	1649-1664-1674
J-2	Submerged ca. 1600-1640	1956	295-310-320	1636-1646-1661
Pl-1	Buried 1676 or later	1959	259-269-289	1670-1690-1700
PR-5	Submerged 1692	1959	258-268-274	1685-1691-1701
SA-2	Submerged 1621	1959	319-334-349	1610-1625-1640
N-4	Manufactured eighth-tenth century	ca. 1950	930 \pm 30	A.D. 1020 \pm 30
N-9	Ninth-thirteenth century	ca. 1950	775 \pm 20	A.D. 1175 \pm 20
N-11	Ninth-thirteenth century	ca. 1950	810 \pm 25	A.D. 1140 \pm 25
S-1b	Late third—early seventh century	1960	1582 \pm 10	A.D. 378 \pm 10

This table is reproduced through the courtesy of Macmillan and Co., publishers of *Nature*.

the earthquake of 1692, when a portion of the city of Port Royal sank below the surface of the sea. SA-2, another bottle fragment, was salvaged from a shipwreck off Bermuda by Mr. Mendel Peterson, of the Department of Armed Forces History at the Smithsonian Institution. Mr. Peterson believes that the preponderance of evidence points to this wreck being the remains of the Spanish ship San Antonio sunk in 1621, but that possibly it could be the Vega, sunk in 1639. N-4, N-9 and N-11, from the collection of the Corning Museum of

Glass, are Islamic specimens said to have been excavated about 1955 in Nishapur, Iran, at the sites Iman-Zadeh (Ghazi-Abad), Deh-Sheikh and Torb-Abad. The best available estimates for dates of manufacture are those listed in the table. Sample S-1b is a small lump of glass excavated in 1960 near the House of Bronzes at the site of ancient Sardis. Professor George M. A. Hanfmann believes that this building was constructed some time between the late third and the early sixth century, and that it was destroyed about A.D. 616.

Sardis, none of which is very well dated. The burial dates calculated are certainly consistent with the known evidence, but these results do not tell us very much about the accuracy to be expected on ancient samples. Nevertheless, the dates are well worth consideration because in the case of the Nishapur fragments the numbers of layers are of the order of 800 to 900—very different from the Colonial glasses. The number of layers on the Sardis sample is again very different from those on the Islamic glasses. It is clear, however, that there is need for further work on samples of ancient origin to confirm the reliability of this method for older objects. There are, of course, certain limitations to the method, but before discussing them let us investigate the causes that lead to the laminar structures.

BRIEFLY, THE LAMINAR STRUCTURE seems to result from either of two periodic or seasonal phenomena: the variation between summer and winter temperatures or the alternation between dry and rainy seasons.

In the graph are shown two curves constructed from climatic data collected at Izmir, Turkey, about fifty miles west of Sardis. The broken curve represents the seasonal variation in mean monthly temperature, marked by a peak in July and August of perhaps 28° C and a minimum in January of approximately 8° C. The solid curve shows the seasonal variation in precipitation, which reaches a peak in the winter and drops off practically to zero in the summer months. Along the bottom are noted estimated "active" and "dormant" periods. In areas with similar climates, and these are not at all uncommon, the decomposi-

Weathered Glass continued

tion apparently proceeds during the winter, when water soaks into the soil, and ceases during the warm dry summer months, when less water, or perhaps no water at all, is available. During the summer the layer of decomposition products formed by the preceding active period becomes dehydrated. The layer is compacted and becomes physically separated and distinct from the remaining glass. In the following active period water seeps through the porous layer and the cycle is repeated. On the basis of chemical evidence it is not to be expected that the layers accumulated through the years would coalesce into a continuous mass, but rather that each would retain its own individual identity.

Although glasses of different composition will corrode to greater or lesser extents (and some are so stable that no corrosion occurs), only the thickness of individual layers varies, and the number of individual layers still depends upon the number of moist-dry cycles experienced.

In the case of objects continually submerged under water, or buried underground in localities where there is abundant and relatively uniform rainfall throughout the year, prolonged changes in temperature, such as the change from an average summer temperature to an average winter temperature, seem sufficient to cause layering.

The most important requirement for successful application of the new method of dating is that the weathering crust be maintained intact. The factor most responsible for the present scarcity of suitable samples is the tendency to clean excavated objects or remove weathering crusts in order to get a better look at the object underneath. Often dealers and collectors intentionally flake off

parts of the crusts to bring out the iridescence. Of course, such pieces can no longer be dated by this method. In addition, there are other limitations. Some glasses are quite resistant to corrosion, while others produce crusts which are so fragile that they cannot be handled without causing serious damage. Over the years the abrasive action of soil will remove part of the crusts from these more fragile objects.

The presence of a yearly cyclical factor in the weathering environment must also be justified. It seems that such factors are more likely to be present in one form or another than to be absent. It is also necessary to assume that the weathering process started at the time of burial, and this assumption also appears to be generally borne out.

IN SUMMARY, it seems reasonable to say that this new method is capable of dating accurately samples of weathered glass similar to the Colonial glasses already studied, and that while further work is necessary on fragments of ancient origin, the results to date are very encouraging.

Archaeologists having objects which they feel might be suitable for dating by this method are invited to submit small fragments for study. It is hoped that in their future excavations they will be especially watchful for fragments which they may wish to have dated.

THE AUTHOR, who has been Administrator of the Scientific Research Program of The Corning Museum of Glass since February, 1960, studied at Rutgers University (Ph.D. 1954) and thereafter taught at Upsala College, New Jersey. The work of developing the new technique described here was done in cooperation with Mr. Harrison P. Hood, Manager of the Chemistry Research Department of Corning Glass Works. Dr. Brill and Mr. Hood have recently published a joint article on the technique in *Nature* (189 [1961] 12). We are privileged to present the first comprehensive account to appear in the United States.

*Highlights of the
Summer issue of*

ARCHAEOLOGY

AVDAT, A CARAVAN HALT IN THE NEGEV

by Abraham Negev

PREHISTORIC MAN IN HAWAII

by William J. Bonk

STUDYING THE DIET OF ANCIENT MAN

by Hans Helbaek

FYRKAT, A VIKING CAMP IN DENMARK

by Olaf Olsen

Archaeology in Borneo

By Wilhelm G. Solheim II

THE HISTORY OF ARCHAEOLOGY in Borneo is primarily the story of one man and one institution. The man is Tom Harrisson, the institution the Sarawak Museum at Kuching. It also involves the clearing of mine fields, present-day megalith builders, bird's nest soup, Alfred Russel Wallace and Thomas Henry Huxley. Like most archaeological stories it is romantic from a distance, but the romance hides heat and humidity, mosquitoes, blood-sucking leeches and tremendous centipedes, swamp, sweat and prickly heat.

Alfred Russel Wallace was probably the first man to believe that archaeological work in Borneo would be worthwhile. Wallace spent several years in Sarawak in the 1850's, where he first heard of some of the many caves in that country. He passed this information on to Huxley and Darwin. The subject of a letter to Darwin, written by Wallace in 1864, was the beginning of Borneo cave exploration to be undertaken by the British Consul at Kuching, Sarawak. The same year Huxley recommended that the Borneo caves should be made the subject of special study, and that an expedition be sent there. With the current interest in the evolution of man, it was felt that Borneo could well have been the home of the "missing link."

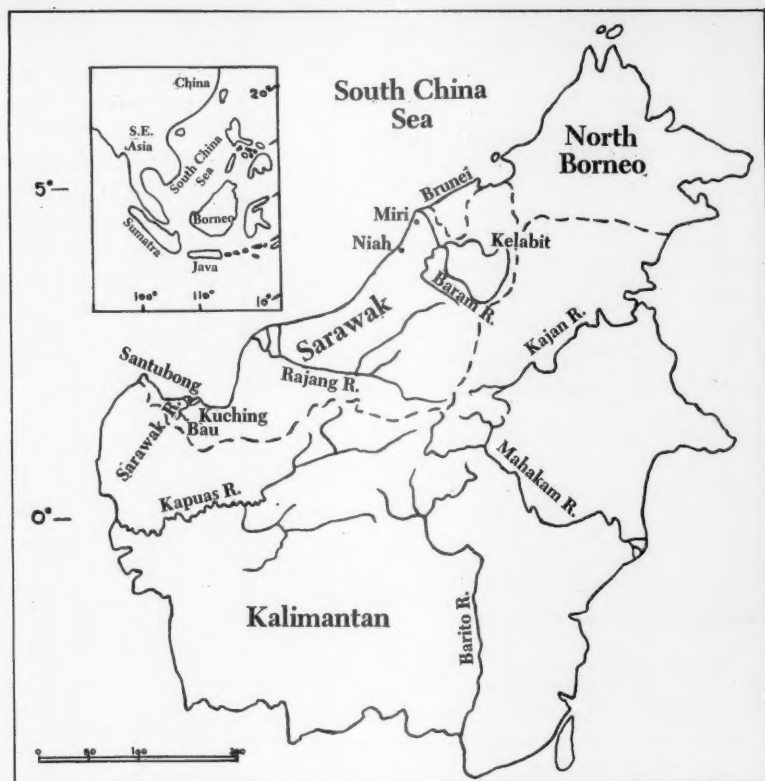
In 1878 A. H. Everett, a man with considerable knowledge of Borneo, received funds from the Royal Society, the British Association for the Advancement of Science and the Zoological Society of London to investigate the Bau Caves and the Niah Caves in Sarawak. But

the result was completely negative. In his "Report on the Exploration of the Caves of Borneo" to the Royal Society in 1880, Everett stated that only recent remains were present in the caves and that continued work would not be worth the expense. This was the end of any extensive archaeological work until 1949. Here and there in various parts of Borneo a few surface finds were reported, but no one took an active interest.

The new Borneo archaeology is somewhat of a paradox. The man responsible was not an archaeologist to start with, and his first attempts in this field were the direct result of military duties. Tom Harrisson is one of that practically non-existent breed of men best called naturalists. He was not a specialist but had considerable knowledge of a number of localities and many zoological subjects, including man. In the early 1930's he was in Borneo with an expedition from Oxford University. In 1945, because of his previous knowledge of the country, Harrisson was parachuted into the interior of Borneo as the leader of one of three groups sent to organize the natives in preparation for the liberation of the island. He landed in Kelabit territory in the far interior, where no white man had been before. There he found a well developed rice agriculture practised by a people who were still erecting megaliths. These megalith builders introduced Harrisson to a present-day prehistory. Later, after the war was over, Harrisson was in charge of clearing mine fields in the delta area below Kuching, the capital of Sarawak. Here he discovered and mapped a number of archaeological sites which, because of the quantities of iron slag present, were responsive to the mine detectors.

As the new Curator of the Sarawak Museum, Harrisson started active archaeological work with the assistance of M. W. F. Tweedie, Director of the Raffles Museum in Singapore. From 1949 through 1957, with the occasional help of Tweedie, Harrisson carried on work on the three main archaeological areas: the Bau Caves, the Santubong area and the Niah Caves. The first four years' work was centered at the sites near Kuching, except for a dig in Brunei. In 1954 the first real testing of the Great Cave at Niah began. This clearly indicated that a major undertaking was required, with much larger funds than had heretofore been available. In 1957 excavation got under way, largely supported by the Shell Oil Company.

Fame soon came to Sarawak and the Niah Caves—not because of the excavations but because of "bird's nest soup." The Niah Caves have long been one of the major sources of the edible birds' nests used by the Chinese for one of their most exotic soups. Taking part in the expedition to Niah was Hugh Gibb, a journalist, who with Harrisson produced a film showing the cave, the bird's nest collecting, and the excavations. This film,



MAP OF THE ISLAND OF BORNEO, SHOWING CAVE SITES.

Borneo continued

which won the Eurovision Grand Prix at the 1958 Cannes Film Festival, has been shown in Europe, Canada, South America and the USSR. It is to be shown on television in the United States, together with several other films on Sarawak.

In 1958 and 1959 excavation continued at Niah, supported primarily by the Gulbenkian Foundation, with continued help from Shell. In 1958 the eminent Dutch palaeontologist Ralph von Koenigswald studied the faunal remains. In 1959 I spent some time working on the Late Neolithic pottery *in situ*, as well as on pottery previously excavated from several of the Niah Caves.

While the major area of archaeological interest in Borneo will continue to be at Niah for many years, work is also going on at other locations. Late in 1959 work was again under way at one of the Santubong sites, where I studied the pottery found during the previous ten years and joined with Harrison in excavating a cave about twenty miles from the Bau Caves. Pottery fragments

showed connections with the Late Neolithic pottery of the Niah Caves, the first such finds outside of the Niah area. Exploration and testing have also been undertaken in the Usun Apao and Kelabit area of the interior.

THE BAU CAVES were the first to be excavated in Borneo. They are relatively small, with deposits sometimes reaching three feet in depth, characterized by large quantities of shell from fresh-water snails in the lower level, historic material in the top few inches, and between the two numerous earthenware potsherds. Though there is some overlap among the three levels, they are distinct. The sherds are plain, or impressed with geometric patterns from a carved paddle. The forms are simple: sub-spherical or gourd-shaped. Charcoal and bones have been found in quantity, but no certain stone tools.

Gua Sirih Cave, though near the Bau Caves, differs from them in many ways. It is much larger and lighter. While the top few inches contain artifacts from the historic period, the pottery is different. Sherds are plain, incised, cord-marked or impressed with designs from a



One corner of the Great Cave, the major area of excavation at the Niah Caves.

carved paddle or one covered with basketwork. There are no geometric designs as on the Bau sherds. Some are of polished ware, while others have a red slip. Potsherds extend to the bottom of the cultural layer. Several polished stone tools were recovered, and in the back of the cave were a number of possibly Mesolithic stone tools, apparently not associated with the pottery. As in the Bau Caves, there were large quantities of fresh-water snail shells, but these were in the same layer as the potsherds. Toward the back of the cave were many small fragments of human bone, presenting the probability of cannibalism. Two charcoal samples are being tested for date by the radiocarbon method.

ARCHAEOLOGICAL WORK began in the neighborhood of Santubong Mountain, in the delta of the Sarawak River, shortly after the first excavations at Bau. The locating of these sites by the use of mine detectors has already been mentioned. At Sungei Buah the first evidence of iron working turned up. Here, seven feet down, were found earthenware crucibles and iron artifacts. According to



Interior of Gua Sirih Cave at the start of excavations. The two bamboo poles in the background were stored there by bird's nest gatherers for use in another section of the cave. No bats or birds live in this part of the cave. Photograph by the author. All other photographs by Barbara Harrisson, courtesy of Sarawak Museum.



Excavation area of the Great Cave. The flags mark burials in the Late Neolithic cemetery.

Borneo continued

Harrison, the several sites which have been investigated fall roughly in the period of the T'ang and Sung dynasties of China (618-1280). Some contain large quantities of T'ang porcelains, with nothing from later dynasties. The porcelains are primarily Chinese, probably from southern China. No Ming porcelain has been found at the Santubong sites nor, for that matter, in any quantity south of Kota Batu in Brunei. On the other hand, there may be some from pre-T'ang dynasties.



Tom Harrison, Curator of the Sarawak Museum, cleaning an undecorated jar from the cemetery in the Great Cave.

While all the sites so far excavated contain varying amounts of essentially similar Chinese porcelains, the locally made pottery and associated artifacts vary considerably from place to place. Several sites have what Harrison terms "Indian" connections. By this he does not necessarily mean direct contact with India, but probably a connection with the Indianized states of Southeast Asia. An example of this connection is the stone Gupta Buddha found at Bukit Maras. To this group of sites also belongs Tanjong Kubor, a small cemetery. I have examined tens of thousands of sherds from Tanjong Kubor, Bukit Maras, Bongkissam and other Santubong sites, and find that some sort of contact with the Southeast Asian mainland is indicated, but not to the same degree at all sites. The immediately neighboring sites of Bukit Maras and Bongkissam, while of approximately the same date, differ both in the relative quantity of Chinese as opposed to locally made pottery, and in the varieties of this local pottery. In general, it appears that the more "Indian" sites are earlier and the sites showing more Chinese influence are later.

In the area of Sungei Ja'ong have been found interesting megalithic remains, including the best known megalith in Borneo. Further investigation was under way at this site at the end of 1959.

The Santubong sites indicate the use of this area as an iron foundry from A.D. 600, and very probably earlier, to about 1300. Since no local sources of iron ore are known, it must have been imported. The choice of this area for an industrial center may have been due to the plentiful



Burial probably of the Mesolithic period. With it, at the left, is a bone from a large mammal.

firewood and possibly to locally available labor. Firewood is today exported from Sarawak to Hong Kong. The local pottery is a combination of the Bau variety, with added foreign forms. These include flat-bottomed vessels typical of South China of 500-1 B.C., and lids with phallic handles. However, Bau designs, impressed by a carved paddle, are commonly found on the Santubong pottery. Santubong must have been an important center of international trade and manufacture for over six hundred years.

THE NIAH CAVES have been given a good deal of publicity in magazines and on television. Two of the many caves that abound in this isolated limestone formation have received the most attention. These are the Great Cave and the Painted Cave. This is partially because these two caves are so spectacular, and also because most of the excavation has taken place in them. Cave exploration was one of the objectives of the 1958 season, and close to two hundred caves were located. Late in the 1959 season one of the smaller caves was chosen for excavation, to test the hypothesis that practically all of the caves had been in use. It was selected because it was small and hard to reach, but a few days of digging turned up so many stone tools of a new type that work had to be discontinued until a longer campaign could give the time needed to excavate the cave adequately.

The Great Cave, in which excavation started in 1954, has to be seen to be believed. It has over twenty-six acres under one roof. Four seasons have been spent in digging

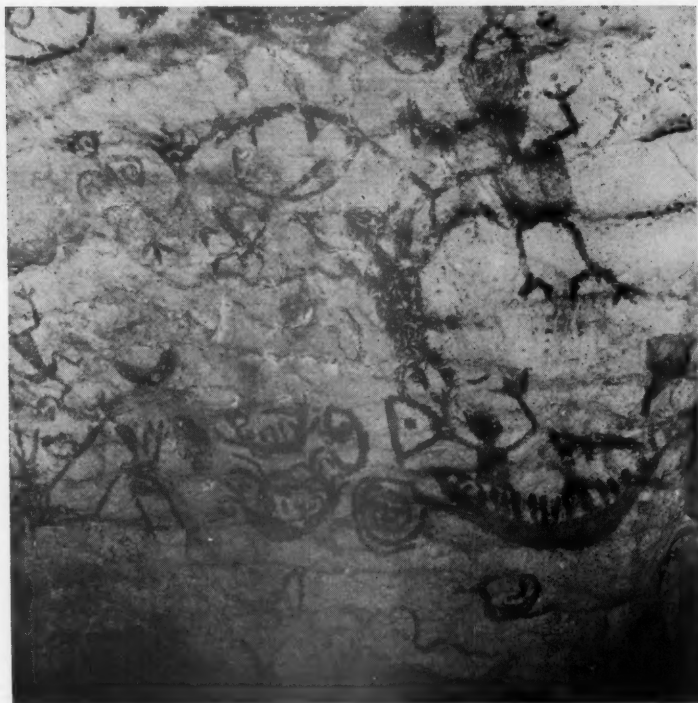
one small corner of it. The excavation is at one side, extending from just under the overhang to several hundred feet back in the cave. Excavation has reached down to six feet over about half an acre and, in a much smaller area, to twelve feet. Bottom has not yet been reached. Just below the surface was found a Late Neolithic cemetery. As each burial was exposed it was labeled, carefully cleared, and then covered to await final excavation at a later date. Well over a hundred of these burials have been discovered. The scarps of the unexcavated sections have to be covered with planks to prevent large wasps, which make their home in the earth, from honeycombing these areas.

The excavated area in the Great Cave appears to have been used until about the beginning of the Christian era, with only one sizable break. (Other Niah caves were occupied until early Ming times, ca. 1400). There is one sterile layer at about six feet, usually varying in thickness from twelve to eighteen inches. This layer is mostly a pinkish, fine powder (not limestone or phosphate) without charcoal remains. (Chemical analysis of this layer is in process.) A number of stone tools have been found, presenting a good sequence. The cultural evolution is completed by quantities of potsherds in the top eighteen inches and the cemetery extending back into the cave, where bronze is associated with a few burials.

From the lowest level upward, the sequence of stone tools is as follows: the deepest artifact yet found, at about 110 inches, is a large flake tool, compared by Harrison to the Soanian flake tools of northwest India. This



An undamaged pot from Niah with an impressed design on its surface.



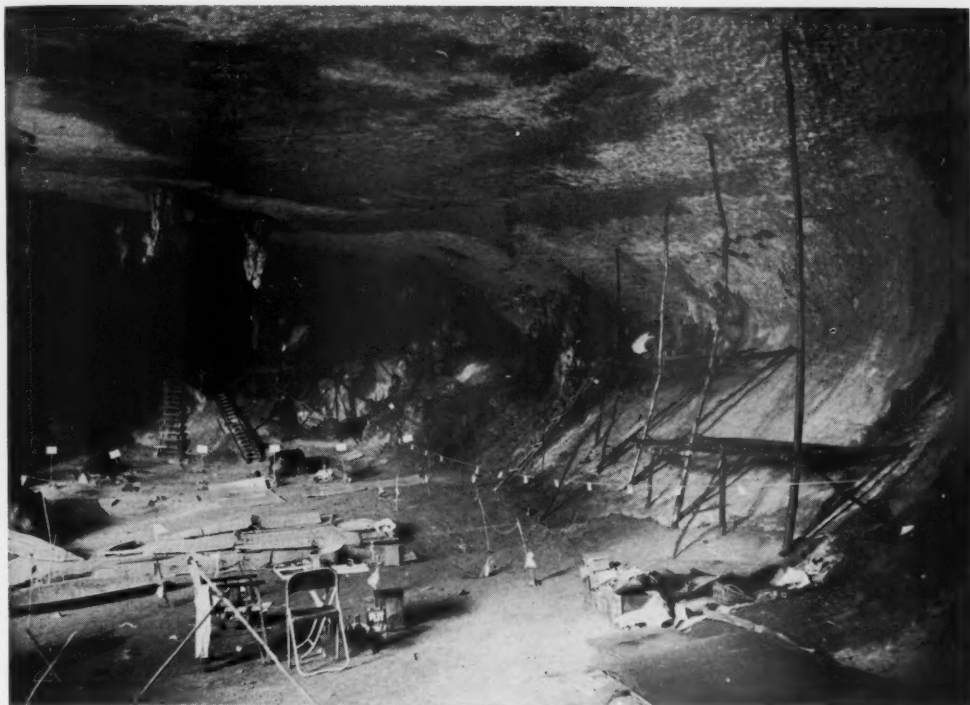
Paintings in red on the wall of the Painted Cave at Niah, showing people and death ships, the subjects most commonly represented.

Borneo continued

is not like the flake tools of higher levels. Both above and below the six-foot level are pebble choppers made from water-worn stones with half or more of the original surface remaining. From a depth of six feet to about four feet (primarily around five feet) are large flake tools showing much variation. From 72 in. to about 42 in. (extensive around 48 in. and below) are smaller, less crude flakes. Thus there is considerable overlap of these three types of tools. From 42 in. to about 24 in. are worked flakes, similar to the smaller flakes found lower down but of better workmanship, flaked pebbles with a ground working edge, smaller unflaked pebbles with ground edge, or sometimes ground all over. These can be considered as Mesolithic. From 24 in. to the surface are found Early Neolithic axes, roundish in cross-section. These overlap both morphologically and in depth with the partially ground pebbles found below 24 in. Generally, above the round axes are found quadrangular axes and adzes, polished all over (Late Neolithic). Unlike the round axes and earlier tools, the quadrangular adzes are all made from a fine-grained black stone. The

levels given for the different types of stone tools are approximate, with a small amount of overlap of all types upward from their most common level, but only rarely downward.

Neither the stone tools nor the associated artifacts and human bones have yet been studied in detail. The human skull found at a depth of 106 in. is being studied by Dr. Kenneth Oakley of the British Museum. The only report on it to date is that it is *Homo sapiens*, with large molars. In the levels with the best worked flakes and the edge-ground tools (ca. 42-24 in.) have been found a number of skeletons. These are in unusual positions, usually distorted and often decapitated. The teeth appear distinctly "Melanoid." Commonly associated are teeth or bones of rhinoceros or other large mammals. Some skeletal material has been found in the round axe level. All that can be said of these individuals is that their body structure is distinctly slighter than those in the cemetery above. There is a possibility that potsherds are associated with the round axes. The burials of the Late Neolithic cemetery are primarily supine, extended, some of them placed on planks or in hollowed-out logs. The teeth are Mongoloid in type, with pronouncedly



General view of the Painted Cave, with boat-coffins appearing at extreme left. On the scaffold at the right is an artist from the Sarawak Museum who is copying the wall paintings, not apparent in the photograph.

shovel-shaped incisors. Three sorts of matting and netting have survived with some of these burials. What are probably copies of functional tools, made in soft stone, are common with the burials; some beads are present, and quantities of earthenware.

The cemetery lasted into a "Bronze Age." In extended burials there were pieces of bronze near the mouth. There were some secondary burials in large earthenware jars, and in several of these were found pieces of bronze and some glass beads. The Bronze Age pottery is closely related to the Late Neolithic pottery and may well be the same.

The pottery in the top 18 inches, associated with the Late Neolithic and Bronze Age burials, is very sophisticated and has wide relationships in Southeast Asia. There are several types and many varieties, the interrelations of which have not yet been worked out. While most of the vessels are plain, there are many sherds with impressed designs and some with incised and painted patterns. The painted pottery is the most spectacular. The designs are in black and red against a light tan background. The painted and incised patterns are similar; maeanders, scrolls and triangular motifs are common. The impressed patterns are cord-marked, basket-marked,

paddle-marked, and some, such as circles, made with a simple tool. This ware is related to pottery in the Philippines, the Celebes, Malaya and Indochina.

The bone tools, found at all levels, have not yet been studied. The faunal remains have received the most attention. Although no fossil bones have been found, several forms from the lower layers are not present in the area of Niah today. Dr. D. A. Hooijer has identified several non-fossil bones from deep levels as being identical to *Manis palaeojavanica*, the monster fossil pangolin of the Middle Pleistocene in Java.

Five Carbon 14 dates (all from the Groningen laboratory) have been reported for four different levels of this cave. At 100 inches the date is 39,600 B.P. \pm 1000. From 72 inches the date is 32,630 B.P. \pm 700. At about 48 inches comes a date of 19,570 B.P. \pm 190. Two dates from near the surface are associated with the Late Neolithic level. From remains of a tree-trunk coffin in the cemetery comes a date of 2455 B.P. \pm 65, and from a charcoal "seal" below the surface at the front of the cave, a date of 2460 B.P. \pm 70. A Philippine site with the related Late Neolithic pottery and quadrangular adzes has a Carbon 14 date of 714 B.C. \pm 100.



Left: Late Neolithic burials at Lobang Gan Kira, Niah. The remnants of a spear shaft protrude from the chest of the skeleton in the foreground. Right: Close-up of the skeleton, clearly showing the spear imbedded in its chest.



Borneo continued

THE PAINTED CAVE was discovered in 1958 by Barbara Harrison, Tom Harrison's wife. This cave, second only to the Great Cave, is an easy hour's walk through the mountain, which is honeycombed with caves connected by passages, and up the side of a nearby limestone formation. I do not mean that the walk is easy, but that a steady, moderate pace will get you there. Going through the mountain requires a guide, as it is easy to get lost in the pitch dark. It is hard to keep one's bearings with only a flashlight, and the trail goes up and down on slippery hills of bat and bird guano. In these rooms with one hundred per cent humidity, simply placing one foot slowly in front of the other results in a bath of sweat. Once out on the other side, a few minutes' walk brings you to the base of the second formation, where it is a short but steep climb to the cave. This is the situation when the weather is dry. When Harrison led me over to this cave, the few minutes' walk took us half an hour in waist-deep water. Three days later, when Harrison had to go there again, the water was up to his neck in spots. Whatever the weather, the trip is worth it.

When you first reach the floor of the cave you notice only the varying pastel colors of the lichens and moss growing on the walls and ceiling, and the stalactites, then the remains of wooden boat-coffins at one side. The paintings do not show clearly except when the light is right. Those first noted were on a section of approximately vertical wall about two hundred feet long and

four to six feet high. The usual objects depicted are people, crescent-shaped boats, possibly the large centipedes and scorpions found so commonly in the cave darkness and, in one case, a fighting cock. The paintings of "ships of the dead" are related to "Bronze Age" art motifs in Indochina, as are the incised and painted designs on the Late Neolithic and "Bronze Age" pottery in the Great Cave.

The paintings are probably later than the related Late Neolithic remains in the Great Cave, as the material associated with the wooden boat-coffins on the cave-floor is primarily T'ang and Sung ceramics and possibly earlier porcelains from South China or northern Indochina. The paintings have all been photographed in color and copied full size by a Sarawak Museum artist.

Only a half dozen of the other many smaller caves have even been sampled. Those few that have been examined have each shown something different, while indicating a general over-all relationship. From this quick look at Borneo archaeology it is obvious that its study has only begun, and that many interesting new developments may be expected in the future.

IN 1953 DR. SOLHEIM, then on the staff of the University of the East, Manila, reported to us on the state of archaeology in the Philippines. Since that time he has been active in many parts of the Far East. Dr. Solheim is Executive Secretary of the Far-Eastern Prehistory Association and Editor of its bulletin, *Asian Perspectives*. He received the Ph.D. degree from the University of Arizona, and last fall joined Florida State University as Assistant Professor in the Department of Anthropology and Archaeology.

By Piero Nicola Gargallo

ANCHORS of ANTIQUITY

Translated and adapted by Evelyn Prebensen

IN THE COURSE OF EXPLORING the sea-bottom to see what I could find that would advance our knowledge of the history of navigation and naval construction and equipment during early times, I paid particular attention to certain areas within the harbor of Syracuse and just outside it. The highly interesting general results of my work I hope to report at a later date. One particular result was that the area yielded parts of no less than sixty different ships' anchors. These form, to my knowledge, the largest collection of Greek and Roman anchors in the world. There were enough to enable me to divide them into types and come to some conclusions about their general development.

What is probably the earliest type is represented by a sort of paving-stone, trapezoidal in form, with three holes in it (Figure 1)—more than merely a chunk of stone such as Homer's sailors used. The direction of the holes and other details have led me to reconstruct the anchor in the fashion shown. By experimentation I have determined that, no matter what the direction of pull, such an anchor would always rest with the two lower arms lying on the ocean floor. Since the pressure falls mostly on the arms, no great strength is required in the stone, and the material is usually less hard than that of the anchors of later date discussed below. The largest anchor-stone of this class that I found is 89 cm. long, 8-14 cm. wide, and weighs 63.7 kg. (140 pounds).

Once we leave this primitive type, we proceed to the standard anchor form of the ancient world, one with a very heavy stock, a long wooden shank and wooden arms without flukes. Naturally, save under exceptional cir-

cumstances (e.g. as at Lake Nemi, where the fresh water did very little damage to the anchors of Caligula's barges), the wooden portions have disappeared and we find only the stocks and miscellaneous fittings.

I believe that the earliest example of this form in my collection is a type with a stone stock. I have found no less than eleven examples of this type. The stocks are

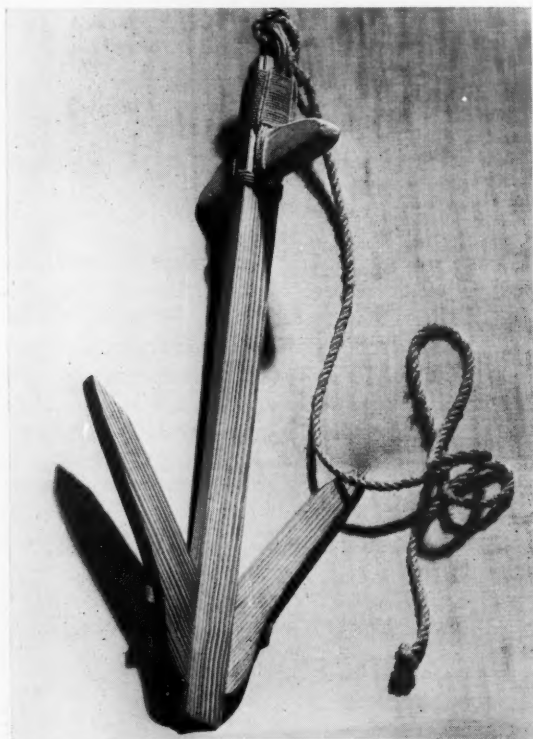


1. An early type of anchor, made of stone. The probable position of the arms is shown by the rods.

Anchors continued

usually long; the largest so far is 1.90 m. long, 11.5 cm. wide and 19 cm. high. Often a square area has been chiseled away in the center to provide a tighter fit for the wooden shank (Figure 2). The stone is almost always particularly hard and resistant; a large stock like the one described above can weigh as much as 183 kilograms (403 pounds). Figure 3 gives my conception of what a complete anchor with a stone stock may have looked like.

A third type is one that has been found in numerous

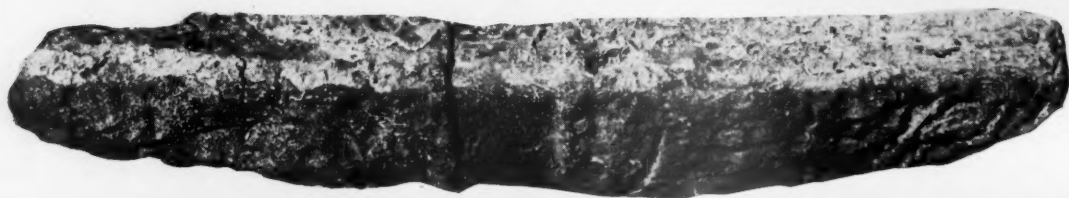


3. Reconstruction of an anchor which has a stone stock similar to that shown in Figure 2.

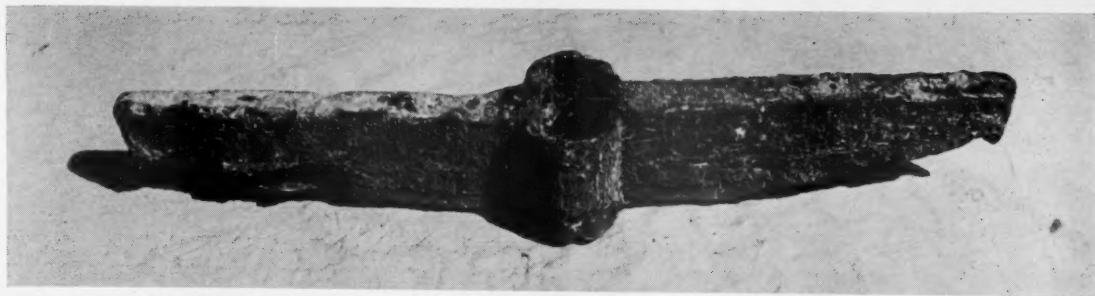
localities. An extremely well preserved example has come from Lake Nemi. In this type the stone stock is replaced by a lead stock with a box-like aperture in the center for the shank (Figure 4). In some cases a pin crossed the aperture from side to side, running through the shank, thus fixing it firmly and permanently in place. The stock is never of lead alone, but of lead over a core of wood. We can even determine the process of manufacture: sometimes lead was melted over the wood, sometimes the lead exterior was made first and the wood introduced through a hole. From the workmanship one can see that some of these anchors were turned out by professional shops, while other cruder ones must have been made by sailors in their spare time.

Anchors of this common type are of all sizes, and my collection includes everything from a monster stock 1.72 m. long and 6.4 cm. wide at the ends and weighing all of 500 kilograms (1100 pounds) to a midget of but 8 kilograms (17½ pounds). The arms of these anchors were held firmly to the shank by a special lead collar, of which I found a number (Figure 5). An interesting feature of some of the stocks is figures in relief (Figure 6). One stock has a head and four knuckle-bones, another four dolphins, and still another an inscription in Latin letters which probably reads TAEI (Figure 7). Does this stand for T. AEI(US)? And, if so, is this the name of the ship's owner? The reconstruction of this type of anchor (Figure 8) is based on the one found in Lake Nemi.

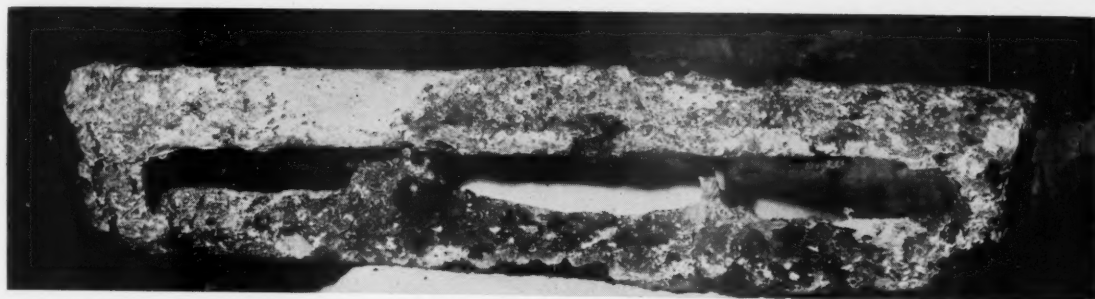
Most boats today are equipped with an anchor that has a removable stock; the stock can be slipped out of its right-angled position and placed parallel to the shank, and the whole apparatus can thus be laid conveniently on the deck. The type is known as the "admiralty" anchor, for it was England's boast to have perfected it in 1852; its actual invention is generally attributed to the Dutch of the seventeenth century. We now know that it goes back to ancient times, and I have found several examples. The lead stock, long and flattened, slipped through a slot in the shank (Figure 9). A ridge running across it served as a stopper. A hole in the stock made



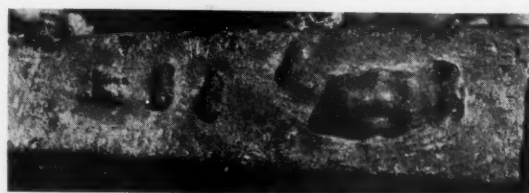
2. Stone anchor stock, showing area chiseled away in the center for attachment to the shank.



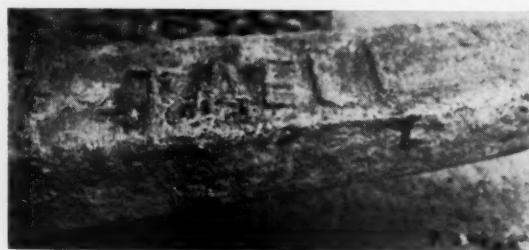
4. Lead anchor stock with an aperture in the center for inserting the shank.



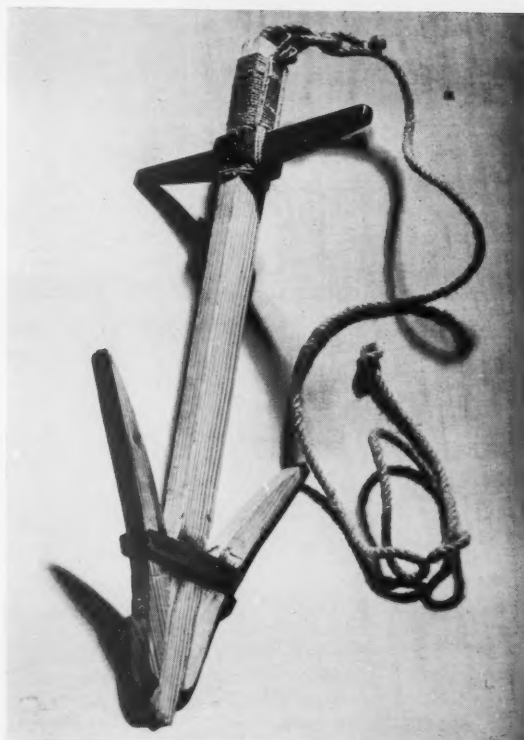
5. Lead collar intended to hold the anchor arms to the shank (see reconstruction in Figure 8).



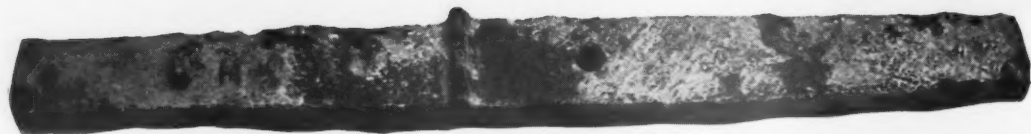
6. Anchor stock showing knuckle-bones in relief.



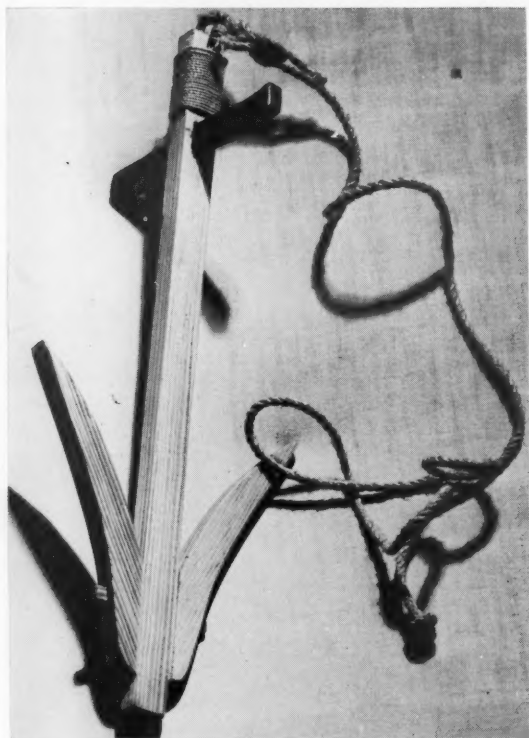
7. Anchor stock with an inscription in relief.



8. Reconstruction of an anchor which is composed of elements such as those shown in Figures 4-7.



9. Lead anchor stock belonging to an "admiralty" anchor.



10. Reconstruction of an "admiralty" anchor.



11. Iron anchor, much corroded, with large ring handle.



12. Large bar of lead which may have been part of an anchor stock.



13. Sounding lead, views of the side and bottom.

Anchors continued

possible the use of a stopping-pin which held the shank snugly against the ridge. Another hole at the end of the stock was probably for a safety cord, that is, a cord was run through it and loosely tied to the shank so that if the stock slipped out of position it would not be irretrievably lost.

The "admiralty" anchors I have discovered are moderate in size. The smallest weighs only 3 kilograms (6½ pounds); it is 35 cm. long, 3-4 cm. thick. The largest is 86.5 cm. long; it weighs 30 kilograms. A reconstruction of this type of anchor appears in Figure 10. An interesting feature which may help determine the date is the presence on one such anchor of the letter *alpha* with its cross-bar in the shape of a V, a form which may point to a date in the Hellenistic period.

The fifth type of anchor which I have found is perhaps the most interesting of all: made of iron, it has a large ring at the top, and arms which in most cases are at right angles to the shank instead of at the more acute angle we are accustomed to in modern anchors (Figure 11). The stock may have been wooden or a strip of iron sandwiched between two pieces of wood, a type common in later ages. It is almost impossible to bring these anchors to the surface because of the poor condition of the material. In some cases the iron has completely disappeared and the only way the original shape can be determined is by filling in with plaster the crust of calcareous matter that has made a natural mold about the anchor. These iron anchors run to considerable size; I have found one fully five meters in length.

Perhaps a sixth type of anchor is to be added to the five listed. In at least two instances I have found in the general vicinity of anchor stocks certain lead objects

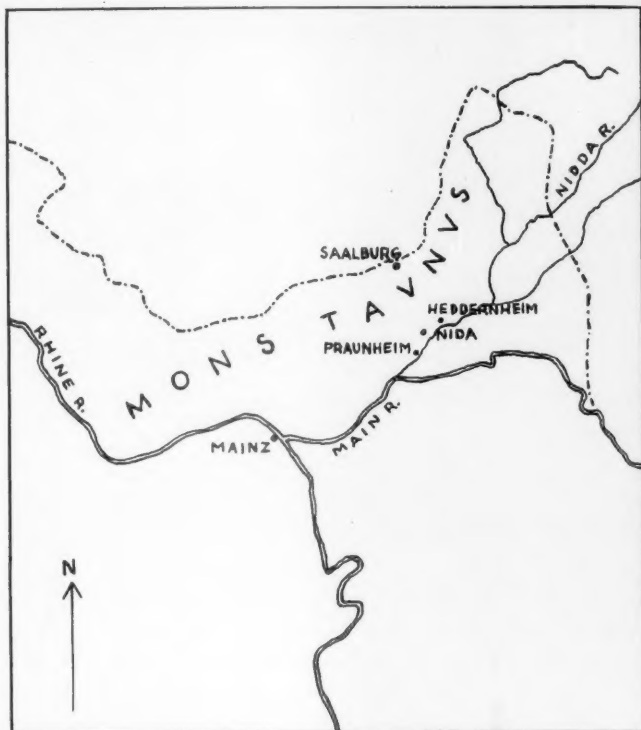
(Figure 12) of considerable size; one, for example, is 70 cm. long and 9.5-10 cm. wide. There are bolts protruding from the surface and a U-shaped opening is cut out of the center. Are these parts of anchor stocks which were sandwiched in wood (hence the bolts) and slipped about a round shank (hence the U-shaped opening)? There is no doubt that the ancients used anchors of metal encased in wood. Diodorus tells how the Phoenicians, in order to carry a load of silver from Sicily, took the lead out of the anchors and refilled them with silver.

Not an anchor but of just as much interest to the student of naval history is a piece of equipment we discovered that is found on all boats today and certainly was carried by all boats of any size in ancient times as well. This is a sounding lead (Figure 13). The one shown is 12 cm. high, the diameter is 9 cm. and it weighs 3 kilograms (6½ pounds). At the bottom, just as on its modern counterparts, it has compartments which must have been filled with some greasy substance in order to pick up samples of the sea floor. The piece has not been cleaned, and the crust which covers it may hide a monogram.

This collection of anchors and other bits of naval equipment is just a small part of what I have come upon in the waters off Sicily. I have found here, as elsewhere, amphorae aplenty and, more significant, quantities of building stone. When the total results are in, I hope to present a report of all that has been discovered, including the remains of the cargoes as well as of the ships that carried them.

PIERO GARGALLO is an expert sailor and an enthusiastic and experienced sea-digger. For years he has been exploring the sea-bottom in the vicinity of Syracuse, and during the past three years he has conducted intensive, organized archaeological investigation of the area. Evelyn Prebensen is his assistant and secretary of the International Institute of Mediterranean Archeology.

By Ulrich Fischer



MAP OF THE AREA AROUND FRANKFURT AM MAIN, SHOWING THE ROMAN LIMES, THE SETTLEMENTS AND THE FRONTIER CAMPS.

FRANKFURT-HEDDERNHEIM:

THE ROMAN EMPIRE at its greatest extent included the area of the present city of Frankfurt, in western Germany, and the fruitful region of the Wetterau north of it. Here the Roman frontier wall, the *limes*, juts out like a bastion toward the northeast. Through the Wetterau a very old road leads toward inner Germany.

Under Augustus an attempt was made to push the border of the empire as far as the Elbe, but the revolt of the Germanic tribes in A.D. 9 and the subsequent disastrous defeat of the Roman commander, Varus, with the complete annihilation of his three legions, put an end to such hopes, and the Romans fell back to the line of the Rhine. Nevertheless, a bridge-head in front of the fort of Mainz remained in Roman hands, and in the time of Claudius this was pushed forward to Hofheim, about midway between Wiesbaden and Frankfurt.

Under Domitian, in A.D. 83, began a war against the

Chatti, the German tribe that occupied the area which is now Hessen. As a result of this war the Taunus ridge and the Wetterau as far as the loop of the Main River near Aschaffenburg were drawn within the boundaries of the empire. The new *limes* then became only a frontier road on the mountains, protected by wooden towers and earthworks, while the troops were concentrated in the great strongholds of the plain. One of these strongholds was Hedderheim, on the north bank of the Nidda River, barely six kilometers northwest of the Frankfurt Altstadt (the mediaeval town). Hedderheim was certainly a cavalry camp, probably that of the *Ala I Flavia*, which formed a mobile reserve of the military frontier system. In A.D. 88 Roman dominion was endangered as the result of a revolt of the governor of Upper Germany, Saturninus. He was defeated, and his XIV. Legion, on which the defence of this area had hitherto devolved,



Reconstructed drawing of the Heddernheim camp, seen from the south, as it appeared at the end of the first century of our era. Only the stone structures have been restored in this drawing.

M: A Roman Frontier Town Beyond the Rhine

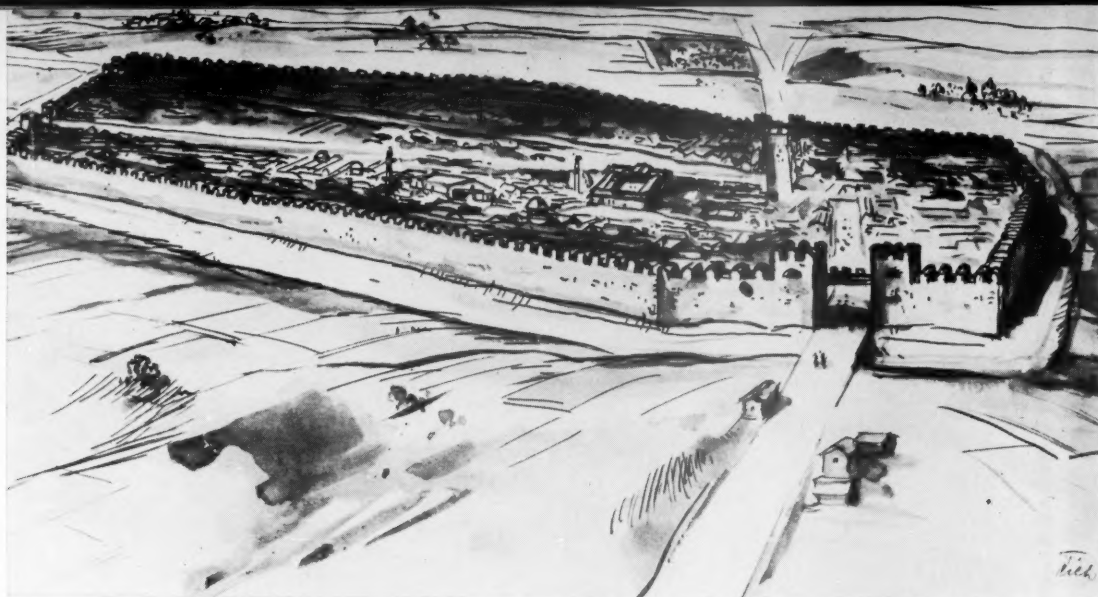
was replaced by the faithful XXII. legion (given the attribute *Pia Fidelis*), which remained at Mainz from that time onward.

As in the case of other Roman fortresses, there was in Heddernheim a military camp town, later called the *Vicus Nida*, whose main part lay in front of the west gate, on the road to Mainz. Perhaps as early as the time of Trajan or, at any rate, soon after Hadrian's accession, a reform in the military occupation of the country was effected. The great strongholds in the plain, among them Heddernheim, were dissolved, and the troops were transferred to the fortresses on the *limes*, which were enlarged and strengthened for this purpose. The Wetterau now became a district of civil government, *Civitas Taunensium*, whose main center was Nida, the former camp town of the Heddernheim fortress. The name Nida appears on inscriptions and is obviously derived

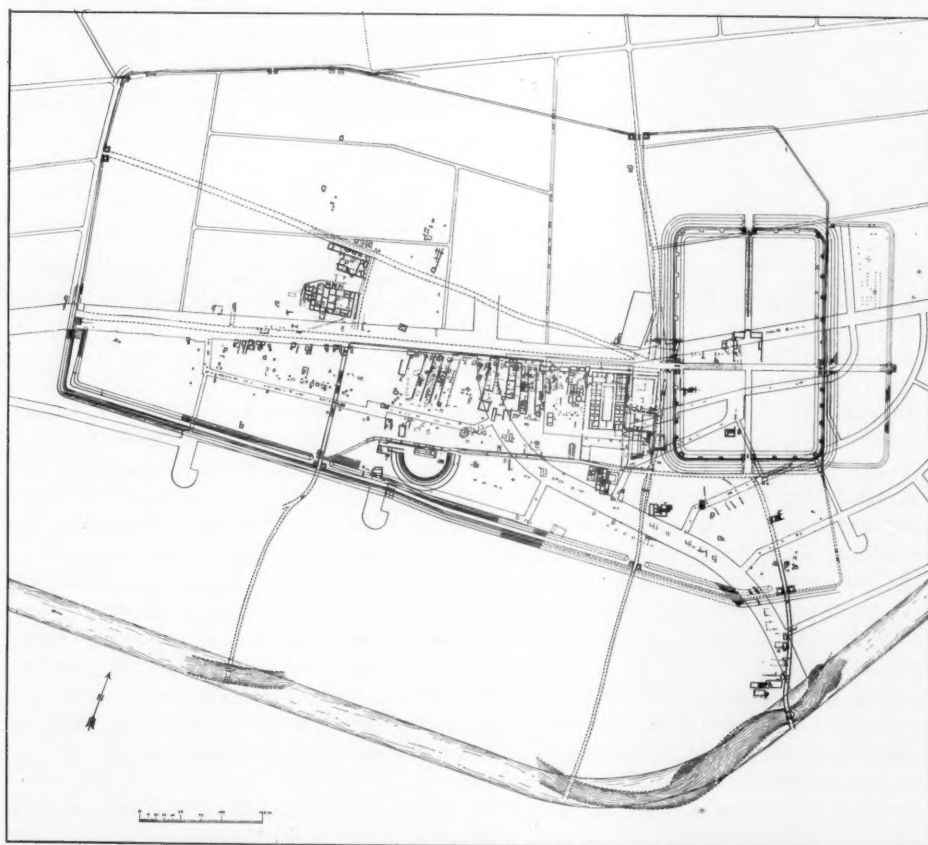
from the name of the Nidda River. The designation *Taunenses* came from *Mons Taunus*, then identified with the castle hill of the town now called Friedberg. Here there was a castle as early as the time of Augustus. Only in later times was the name applied to the Taunus mountain range.

It was natural to transfer the center of administration to Heddernheim because of its favorable position on a waterway; a similar situation favored the flowering of Frankfurt in the Middle Ages. Moreover, at the mouth of the Nidda River, where it flows into the Main near Nied, a suburb of Frankfurt, were the main tile works of the army of Upper Germany.

Probably at the beginning of the third century Nida was surrounded with a wall for protection against the Alemanni. This wall measured nine hundred meters from east to west and five hundred from north to south, en-



Reconstructed drawing of the town of Nida, from the south, as it appeared in the third century.



PLAN OF NIDA DRAWN BY K. WOELCKE, 1938.

Frankfurt-Heddernheim continued

closing an area as large as the mediæval town of Frankfurt. Nida must have survived several enemy attacks; about A.D. 250 it was abandoned by the Romans, together with the frontier territory east of the Rhine, and after that the site remained deserted.

NOT A SINGLE THING which we have said thus far about Nida-Heddernheim is mentioned by the ancient historians; our knowledge comes entirely through archaeology. But long before the work of archaeologists could commence Nida was thoroughly destroyed, as thoroughly as an ancient ruin can be, for it did not lie in a forest which would have protected it, like the Saalburg camp on the Taunus pass, but right in the middle of a thickly settled plain. We learn from the books of Frankfurt architects that as early as the fourteenth century people were breaking up "Heddernburg" stones. In the eighteenth century, when the first descriptions of scientific interest appear, only the ramparts of the city walls and a few streets and refuse heaps within them were to be seen. Throughout the nineteenth century blocks were dug up and foundations destroyed by the owners of the fields; and coins and other antiquities were collected and sold in the Frankfurt market until the beginning of the twentieth century, when this material was practically exhausted and interest fell off. Today only the slightest traces are visible above ground.

Archaeological investigation of Roman occupation on the "Heidenfeld" west of Heddernheim began early in the nineteenth century and was conducted from Wiesbaden, the capital of the duchy of Nassau, to which the village of Heddernheim then belonged. In 1827, the archivist F. G. Habel drew the first exact plan, on which were indicated the finds which had appeared in the course of the centuries. Especially notable were the sculptures of a Mithras sanctuary discovered in 1826 (the first of four found at Heddernheim), which are in the Wiesbaden Museum.

These were not yet real excavations; such began only after the founding of a historical museum at Frankfurt in 1878. In 1896 Prof. G. Wolff of the Frankfurt Gymnasium located the *castellum* of the Flavian and Trajanic period. South of the main city street were found the foundations of houses and of a large public building (the so-called Forum). In 1907 the great public baths were discovered. Unfortunately all the foundations had been removed, but the wall trenches, filled with debris, indicated the lines of the main walls.

Monumental remains were recovered mostly from the wells, which in Roman Germany have always yielded fragments of architecture and sculpture. In 1884 the

so-called giant-column, five meters high, was salvaged from a well. This bore an inscription stating that it had been restored the day before the Ides of March, A.D. 240—that is, a decade before the end of the city—probably as the aftermath of an enemy raid. In 1887 another important Mithras relief was found in the so-called Third Mithraeum. This was unfortunately destroyed during the Second World War.

Excavation at Heddernheim increased substantially after the foundation of the national Reichs-Limeskommission, which was active from 1892 to 1903. In that year, at Frankfurt, was formed the *Römisch-Germanische Kommission*, which is still the center of West German archaeological research north of the Alps. Excavation was undertaken with the support of the Historical Museum and the two historical societies of Frankfurt, and continued until 1925. Through this work it was possible to determine in a general way the circumference and the interior arrangement of the ancient town, and to clarify its historical development.

After World War I the private organizations which had sponsored archaeological research were no longer able to support it, and the task fell entirely to the city's Historical Museum. In 1927 a new campaign in Roman Heddernheim was begun under the direction of Dr. K. Woelcke, Curator of the museum's archaeological department. The immediate cause of this activity was the plan to construct a modern suburb over the whole southern half of the area of ancient Nida. This was the so-called "Roman city" of the Frankfurt architect, E. May, which in its time was a notable example of modern European housing (shown on page 41). The excavations, which lasted until 1929, fixed in essentials the plan of the ancient city. On the basis of these Dr. Woelcke published in *Germania* (1938) the final general plan. In 1937 an independent Museum for Pre- and Protohistory was established in the Dominican cloister, and here for the first time the monuments of ancient Frankfurt were suitably exhibited.

The Second World War sharply interrupted the investigation of ancient remains. The museum in the clois-

DR. FISCHER is Director of the Museum für Vor- und Frühgeschichte (Pre- and Protohistory) of the City of Frankfurt-am-Main. Its attractively displayed collections include material from all periods of Frankfurt's past. The museum building—the venerable castle of the von Holzhausen family—is itself worth seeing; it stands in the middle of an artificial lake and is approached by a bridge.

A native of Königsberg, Dr. Fischer graduated from the University of Halle (1939-40). He served in the army from 1940 until taken prisoner by the Americans in 1945. Later he was on the staff of museums at Halle, Mainz and Kempten until appointed to his present post in 1954. Dr. Fischer's interests include both Neolithic and Roman periods.

Frankfurt-Heddernheim continued

ter was destroyed, but the objects, except for the Mithras relief, were saved. In the first difficult post-war years, archaeological investigation in Frankfurt was at a standstill. Only in 1952 was the Museum of Pre- and Proto-history able to resume its activity under Dr. H. J. Hundt, and in the following year it found a new home in the Holzhausen castle. Excavation began that year in the Altstadt, which had been destroyed in the war. Here were uncovered the remains of the Roman castellum on the Main River crossing and the Carolingian royal palace, as well as those of the palace of Barbarossa in the Saalhof. In 1957 digging began again in Heddernheim, when houses were being built along the new Konstantinstrasse in the area of the ancient city and the north part of the castellum, which had not yet been fully investigated. Here were conducted three campaigns (1957-59) in which modern excavation methods were used for the first time. Of these most recent investigations, which are still to continue, only a preliminary report can be given here.

ALTHOUGH THE OLDER INVESTIGATIONS produced poor results in the north part of the Flavian castellum, modern excavation has yielded a clear picture of the camp structures. Not more than two feet under the surface appeared the burned walls of the Roman barracks, as clearly as on a drawing board. The soil is yellow loess, about six meters deep above a gravel terrace into which the wells were dug. In the higher levels the loess changes into loam, and in this brown loam traces of the ancient structures appear in distinct colors—red, black and green. The buildings were mostly barracks, made of wood and clay, although the camp had stone defence walls and a headquarters building (*principia*) of stone. The foundations of the *principia* as well as of the fortification walls had been removed in ancient times, and it appears that the camp must have been completely abandoned as the result of Trajan's military reform. However, there still remain layers of colored wall plaster with simple geometric decoration in northern provincial style. These as well as fragments of window glass show that the rooms of this building were not so bare as were the accommodations of the rank and file.

In one of the barracks, almost fifty meters long and

Above: Traces of the barracks construction in the Heddernheim camp. Excavations of 1958.

Center: Vertical profile showing traces of the barracks construction at the Heddernheim camp. Excavations of 1958.

Below: Cellar of a third-century house with a wall niche, built into the wall trench west of the north tower.





Left: Raising a cornice stone from a well with block and tackle. *Right:* Excavating on the Konstantinstrasse, Hedderheim. A Roman block is being removed with the aid of modern machinery.



The modern "Roman city" planned by the architect E. May. The excavations of 1957-59 took place just beyond the new buildings in the center.



Red sandstone relief depicting Mithras slaying the bull. Found in 1887 in the Third Mithraeum, this relief was destroyed during the Second World War.

Frankfurt-Heddernheim continued

ten wide, at least two building phases could be recognized. The construction technique probably required sleepers laid in the foundation trenches, and into these were inserted upright posts, the intervening spaces filled with interwoven poles, straw and clay. Finally, the walls were covered with thin white plaster. The roofs were shingled or tiled. Charcoal, burnt clay, plaster and broken tiles were found in abundance. Perhaps the barracks were regularly burned down when camp was broken; one need not assume destruction by an enemy, for such a procedure was used to destroy vermin. Barracks appear to have taken up most of the camp area, with narrow gravel walks between. Drainage was supplied by canals which flowed into a main canal under the broad paved road; this was channeled through the north gate over the ditch by means of a bridge, as can still be seen from traces of clay. In a cavalry camp there was naturally a great need for water. Clay-lined water basins were used; two of these have been found. A smithy has also been discovered, with remains of charcoal and slag still preserved.

The defence arrangements are known from only one

test trench. Outside the wall, which was two meters thick, was a double ditch about three meters deep. The north gate was flanked by two strong towers; in front of these a wooden bridge spanned the ditch.

The remains of the camp thus far described all belong to the time of Domitian and Trajan, as is clearly shown by the coins and the pottery. This constitutes the first period of the settlement. The second period, which includes the second century, is characterized by irregular pits as deep as three meters, which probably were for mixing clay. The civilian settlement developed to the west outside the camp, and the old castellum area appears not to have been inhabited until the third century, when the area was enclosed within the walls. Early in the second period *terra sigillata* was imported from eastern Gaul (Lavoye, Madeleine), later, chiefly from Rhein Zabern and Trier.

IN THE THIRD and last period, the true city period, scattered buildings were erected, with farmyards and storehouses; apparently Nida never entirely filled the space within its outer wall. A house with a cellar was excavated west of the north gate; it had been built into the earlier wall trenches and was easily recognizable by



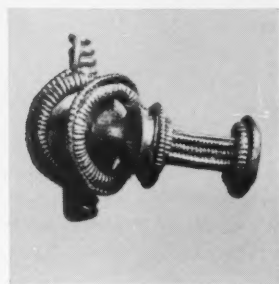
Terracotta figurine representing a Roman rider. Height 23 cm. Second century.



Left: Bronze strap attachment of the latest Roman period, found in 1958. Height 7.15 cm.



Right: Ornamented lead mirror-frame of the middle period, found at the north gate of the camp. Height 11.3 cm.

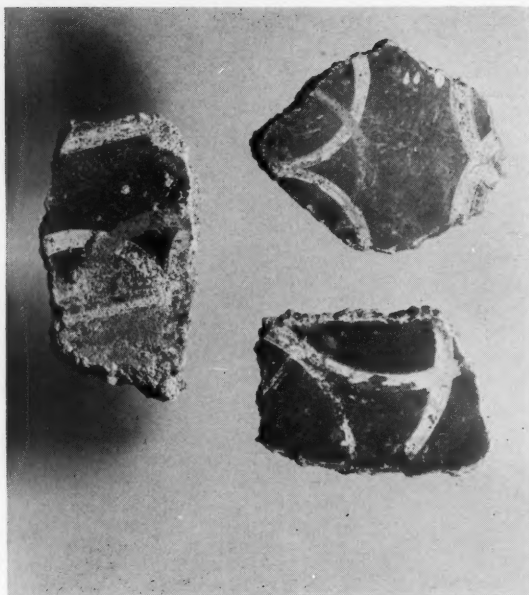


Silver "trumpet fibula," an elaborate brooch found in a rubbish heap. Height 3 cm.



Above: Terra sigillata bowl (Dragendorff's Form 29) signed RANTO. Found in 1906. Height 8.2 cm.

Left: Glass urn containing cremation burial. Found inside a stone chest, in a cemetery on the Trajanstrasse near the northeast corner of Nida. Excavations of 1959. Height 29 cm. Second century.



Fragments of painted plaster, with impressions of wood on the back, from the camp barracks. Excavations of 1958.

Frankfurt-Heddernheim continued

its deeper foundations. Here, by a miracle, parts of the cellar walls were also preserved. The house was seventeen meters long and nine wide, with a cellar in the southeast corner and a vestibule on the north to which led a paved road. In this house was found a Neolithic "shoe-last" celt of the third millennium B.C. Evidently as early as Roman times such an object was used as a "thunder axe," as it so often was in the Middle Ages and later. About twenty meters to the south lay the destroyed cellar of a second house, likewise with an entrance at the north. These were frame houses with stone foundations, and in contrast to the buildings of the camp period, they were roofed with great hexagonal slate slabs. This type can be seen in the German villages of the region to this day. Two wells were excavated, a timbered one 9.60 m. deep, which was dry, and one lined with basalt stones (11.50 m. deep) which contained some water. These showed that the level of ground water has sunk two meters since ancient times. In the stone-lined well were numerous architectural members, of yellow sandstone: architrave blocks, half-columns, and a capital decorated with foliage and human heads. It appears that a building with a stone façade stood somewhere nearby. All these buildings of the third period contained coins and finds of 200-250, the time of the destruction. The series of

coins, apart from three early pieces, extends almost unbroken from Vespasian to Philip the Arab.

As always in Roman levels, pottery was abundant, in sharp contrast with the poverty of ceramic finds from the mediaeval and later levels of the region. Sherds of more than one hundred South Gallic relief bowls were found. On the other hand, there were only a few sherds of hand-made Germanic pottery. Weapons were few—a sword handle, several arrowheads, spear points, a bone bow-stiffener, a stone sling-bullet. No horseshoes were found. All the finds bespeak a peaceful abandonment of the place. Bronze plaques from leatherwork, iron tools and a few fibulae fill out the picture. A decorated mirror handle belongs to the second period. All the finds end by the middle of the third century; after that the first evidence of life comes from the glazed sherds of the late Middle Ages. That the Germans avoided the Roman cities is well known from the old writers. The reason lay in their different form of economy. The German settlement of this neighborhood, around Heddernheim and Praunheim, began in the valleys where there was water and pasture for cattle. Settlement of the higher, drier terraces, which was typical for the Romans, presupposes a developed water supply and drainage. So it is no accident that in many places building over Roman cities began only in the twentieth century, as is the case on the Heidenfeld near Heddernheim.

Outside the walls, as everywhere in antiquity, lay the cemeteries of Nida, chiefly to the west, on both sides of the military road to Mainz, but also to the north, on the road to Saalburg and Okarben. Here, unfortunately, there has been no extensive excavation, owing to the rapid spread of modern construction. We were able to salvage a few graves near the canal and the house construction outside the northwest and northeast corners of the "Roman City." Among these, stone cists containing glass urns with cremation burials are especially typical of the second century.

On the whole, the cultural level of this frontier town does not compare with the splendor of the metropolis of Mainz or the later imperial city of Trier. Nida was a market town on the military frontier, testimony to a short sojourn of Roman culture—hardly 170 years—on the right bank of the Rhine. But in comparison with other sites it has been relatively well investigated. That in its second period Nida was a center of industry and commerce is shown by its radiating roads, by the harbor on the Nidda, and by the numerous pottery kilns. The collections of the Frankfurt Museum for Pre- and Protohistory are based for the most part on the Heddernheim finds, and they provide a graphic picture of this settlement, which was the ancient forerunner of the modern city of Frankfurt-am-Main.

ARCHAEOLOGY

as a CAREER

By JOHN HOWLAND ROWE

ARCHAEOLOGY, in the broadest sense, is the study of man's past. This past is important to us for a number of reasons. In the first place, a knowledge of what went on in the past can help us to understand why present conditions are the way they are and not somehow different. For example, the former existence of the Roman Empire and the particular nature of Roman institutions are facts which have an enormous present-day importance, and knowledge of Roman arts and institutions helps to explain many features of modern life. In the second place, many products of the past have survived into the present and thus become part of the modern world. Ancient art is admired, and ancient literature is read by many people for pure enjoyment, or because they believe that it still has a message for them. It often increases the enjoyment and comprehension of ancient art and literature to have some knowledge of the cultural context in which it was produced. In the third place, the past has a peculiar scientific importance. It is only in the record of the past that we can hope to find out how human culture changes

through time, and cultural change is a problem of great interest to students of human behavior. The most important thing about the past, however, is that it is there, and men have devised ways of finding out about it, as they have devised ways of finding out about the distant stars and the abysses of the sea. Whatever can be studied attracts the curiosity of inquiring minds, and curiosity about the past makes archaeologists.

The study of the past is one of the most difficult of all research undertakings, for what men did in the past cannot be observed directly and must be inferred from traces of its results and from reports by witnesses of varying degrees of explicitness and reliability. The difficulty of the task only makes it more of a challenge, however, and helps to explain the public interest aroused by archaeological discoveries.

We began by saying that archaeology is the study of man's past. However, this definition is not enough to distinguish archaeology from history, a field which can also be described as the study of man's past. The distinc-

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An earlier version of this essay was published in *ARCHAEOLOGY* 7 (1954) 229-236. The author has rewritten it in the light of his own experience as a teacher and with the help of advice and suggestions from many colleagues. In particular, the interest of Clifford Evans, Lucy T. Shoe, Erik Sjöqvist, Gus Van Beek, Waldo R. Wedel and Gladys D. Weinberg is gratefully acknowledged.





Laboratory work is an important part of every excavation project, for the objects found must be preserved, studied and prepared for illustration or exhibition. Here an expert technician mends vases from the American excavations at the Agora in Athens. Surviving fragments are cemented together and gaps filled with plaster. Photograph courtesy of Agora Excavations.

Archaeology Career continued

tion between these two approaches is primarily one of emphasis on different kinds of evidence. Historians are primarily concerned with interpreting the evidence of documents. In the technical sense in which historians use this term, "documents" are written communications of any kind, public or private. Archaeologists, on the other hand, are more concerned with monuments and their associations. "Monuments" in the archaeological sense, the sense in which the word is used on the seal of the ARCHAEOLOGICAL INSTITUTE OF AMERICA, include structures of all kinds, and objects which have been modified, used, or even merely transported by men at an earlier time. Both art objects and objects of everyday use are monuments in the archaeological sense and can be taken as evidence of certain aspects of the behavior and values of the people who made and used them. Associations, the other main concern of archaeologists, are the spatial relationships existing among monuments as they are found, or between monuments and natural features. The position of a monument provides evidence for the behavior of the last person who touched it and for its date relative to other monuments.

Documents were, of course, used as evidence for study-

ing man's past long before the development of a systematic interest in ancient monuments. The first person in whose work we can recognize the archaeological point of view was Ciriaco de' Pizziccoli of Ancona (1391-1452). A contemporary biographer, Francesco Scalamonti, tells us that, when Ciriaco explored the ruins of Rome in 1423, "the stones themselves seemed to him to provide more reliable information than the books." This comment was not intended to imply that Ciriaco rejected the literary tradition which the humanists of his time were engaged in recovering; rather, it reflects his excitement at discovering another kind of evidence about the past which provided an independent and more direct testimony. He felt himself face to face with the ancients as he looked on the works of their hands. It is the same feeling which has inspired many later generations of archaeologists.

Archaeologists cannot afford to ignore historical documents relating to the people they are studying, and historians likewise gain by interpreting their documents in the light of the monuments. The overlap is particularly great for those places and periods for which we have written records surviving on the monuments. In such cases it may be convenient to maintain a division of labor by having one man consider the finds as monuments and



Training in excavation: an undergraduate student cleaning a burial for photographing as part of the work of a course in archaeological field methods. The site is the Patterson Mound in Alameda County, near enough to San Francisco to be accessible for weekend sessions. Photograph courtesy Department of Anthropology, San Francisco State College, and Adan E. Treganza.

another consider them as documents, but the man who is trained to combine both approaches is best equipped for the task of understanding and interpreting the past. Sometimes the man who makes this combination is primarily a historian, like Michael Rostovtzeff; sometimes he is primarily an archaeologist, like Henri Frankfort, but in either case the broad view makes possible an intellectual leadership which is denied to the narrow specialist. Anyone who is preparing himself to do archaeological research in an area where historical documents are available is well advised to learn the methods and perspectives of the historian as well as those which are particularly characteristic of the archaeological approach. Such preparation involves learning the languages and writing systems in which the historical documents for the area are written and studying the texts in these languages which are already available.

In one respect the archaeological approach permits a broader perspective on man's past than the historical one. Writing is a relatively recent invention in the total span of man's existence, and for a substantial part of the past we have no contemporary historical documents whatever. Even in the case of periods and places for which such documents are available, the documents cannot always be read or may give only very limited information

about events and customary behavior. In such cases the student of the past has no choice but to concentrate his attention on investigation of the monuments.

The interpretation of archaeological findings in terms of actual behavior is done by comparison with the uses of similar monuments among historic or present-day peoples who used or still use similar structures or objects. Information secured from ethnographic studies of cultures different from our own is thus of capital importance. Even the archaeology of Europe and the Near East has profited greatly from the results of ethnographic studies made in small towns and rural districts in these areas. Places can still be found where industrialization and its by-products have not wholly destroyed the local cultural traditions. Archaeologists need to know the ethnography of the areas in which they work and will find it very rewarding to devote some time to ethnographic research of their own. Only someone familiar with the archaeological problems of an area can make the observations and ask the questions which are most directly pertinent to these problems.

An interest in the present inhabitants of his area is also important to the archaeologist planning to do field work, because it smooths his way in enlisting local support for his research. People are rarely indifferent to the



Tell Judaidah, a great habitation mound in Hatay province, southern Turkey. Here the succession of layers is under preliminary examination by means of the step trench method. Step trenches dug on one or two of the steepest slopes on either side of the mound provide a quick (but not very precise) notion of the general content of the mound in stratigraphic sequence, and enable the field director to decide where to begin a major excavation. Photo courtesy R. J. Braidwood and the Oriental Institute.

Archaeology Career continued

ancient monuments found in their territory. More often their religious prejudices, interest in the potential commercial value of their antiquities, or pride in the evidence of their nation's former greatness are so strong as to provide sharp restrictions in law and practice to what an archaeologist can do. A knowledge of the spoken language and of local custom and feelings not only makes it possible for him to avoid offence but also to seek cooperation and positive support for his projects from the local people who are in the best position to help him.

Archaeology has an important relationship to the field of art history which also deserves comment. Art historians are concerned with monuments, but only with those monuments which are considered works of art. In their concentration on monuments as art, art historians have developed methods of stylistic analysis by which they can date very precisely the objects they study. Archaeologists who learn these methods can apply them to a wider range of monuments with great profit. Similarly, art historians can and do make use of archaeological methods of interpreting associations in order to solve some of their problems of dating.

The relationship between archaeology and art history has always been particularly close in Classical studies, where the specialist in each field is supposed to know the other as well. Indeed, for much of the nineteenth century, the distinction between Classical archaeology and art history was so blurred that Classicists often defined archaeology as the study of ancient art.

THE FOREGOING COMMENTS on the relationships between archaeology on the one hand and history, ethnography, and art history on the other help to explain the way archaeology is taught in American universities. Its recognition as a regular academic subject is relatively recent, and courses in particular archaeological fields have been organized by a variety of departments which felt the need for certain kinds of archaeology to support their programs. Thus, departments of ancient languages and literatures are likely to offer courses in the archaeology of the area with which they are concerned, on the principle that this type of study will help students to place the ancient literature in its cultural context. Departments of Classics generally offer some instruction in Greek and Roman archaeology, and many departments of Near Eastern languages also provide course work in the archaeology of Egypt, Mesopotamia and other Near Eastern areas. The archaeology of the Orient may similarly be covered in departments of Oriental languages, although this combination is less common. Many departments of art give instruction in Classical archaeology in connection with their programs in the history of ancient art, and the larger ones may provide facilities for work in the archaeology of Egypt, Mesopotamia, India and China as well. The archaeology of all parts of the world and all periods not otherwise covered by the instruction given in the language, literature, and art departments is taught, if it is taught at all, in departments of anthropology in association with ethnography and with particular reference to the problem of studying cultural change.

Most departments of anthropology offer a course in archaeological field method, and general survey courses in archaeology are becoming commoner in anthropology programs. Naturally enough, very few departments of anthropology have the staff and the resources to give specialized instruction in the archaeology of all parts of the world not covered in some other department, however much they may wish to do so. The parts of the field most commonly covered are North America, Mesoamerica, and the Pleistocene archaeology of the Old World, with emphasis on Europe and, in recent years, Africa as well. A student interested in specializing in some other area, such as South America, Oceania, Australia or Asia, or in Africa since the Pleistocene, must pick his university carefully to find one which has a specialist in his chosen field.

The present situation in which instruction in archaeology is divided among several university departments has both advantages and disadvantages. One of the advantages is that the archaeology of areas which have abundant historical and literary records is taught in close association with instruction in the languages concerned, thus encouraging students interested in the archaeological approach to prepare themselves to understand and use documents as well as monuments. Another advantage is that the division of archaeology among several departments provides greater support for the subject than would be possible if it constituted a separate and, in a sense, competing department. On the other hand, the present situation undeniably makes it more difficult for an archaeologist specializing in one area to understand or keep up with what is going on in other branches of his own subject.

The situation in museums parallels that in universities in the sense that the unity of archaeology is rarely recognized. There are a few museums devoted exclusively to archaeology, but more often one area of archaeology is treated as an extension of some other subject. All museums of anthropology have archaeological collections, although the fields represented are likely to be restricted to those covered by courses in university anthropology programs. The Lowie Museum of Anthropology at the University of California is one of the exceptions to this general statement. Natural history museums generally include a department of anthropology and maintain archaeological collections as part of their anthropology program. Many art museums have archaeological collections as well, although art museums tend to collect selected specimens of ancient art rather than antiquities in general. Historical museums often include a collection of local antiquities.

ARCHAEOLOGY is a field of research rather like astronomy

in that its applications are not so obviously profitable as to make it a subject of much interest to business and industry. Business firms do not hire archaeologists, although now and then a firm will support an archaeological research project as part of its public relations program. At the same time there is little public demand for the services of archaeologists. No archaeologist could make a living by organizing a private practice, like a physician or a lawyer. The result of this situation is that there are very few positions available for professional archaeologists. It is also difficult to raise funds to finance archaeological research projects, for most foundations and private donors prefer to support research which has more to contribute to business or national defence or which is directed toward humanitarian goals or social uplift. Even when funds are available for archaeological projects they are usually limited to the special expenses of the work, such as travel expenses, purchase or rental of equipment, technical help, and payment of workmen, with no provision of salary for the archaeologist.

It is important to emphasize the economic difficulties of archaeology as a career, because they are not always obvious to people whose imagination is fired by reading of great discoveries or by visiting museums and ancient ruins. Employment opportunities are few, the competition for them is heavy, and salaries are comparatively low. At the same time, archaeology is a field which requires thorough training and usually a Ph.D. degree (i.e., three to five years of graduate work after the normal four years of college). No one should plan to make a career of archaeology unless he is so deeply interested in it that he is not really concerned about how much he is going to earn.

The best positions open to archaeologists are those as college and university teachers or museum curators, and such jobs are strictly limited in number. Only the larger colleges and universities teach archaeology, and relatively few museums can afford to have research men on their staffs. In these jobs, of course, the archaeologist is expected to devote a substantial part of his time to teaching or to the care and exhibition of collections, and his research has to be carried on very largely in his spare time, evenings, weekends, and during vacations. Archaeologists do not work bankers' hours. Field trips, except for work on local sites, require leave, and if the archaeologist has a family to support it must usually be leave with pay. Few universities or museums can afford to be liberal with leave of this kind.

An archaeologist's chances of securing an appointment in college teaching or museum work are much improved if he has broad training in another subject. If the kind of archaeology he is interested in is usually taught in a department of anthropology, he should be prepared to

Archaeology Career continued

teach general anthropology. A Classical archaeologist should be prepared to teach ancient civilization and Greek or Latin literature or to give general courses in the history of art. Corresponding combinations are advisable for archaeologists interested in the Near East or the Orient. Museums are usually interested in the same kind of qualifications, though somewhat greater concentration on one particular area may be considered desirable. There are some excellent positions available in the larger art museums for people who are thoroughly trained in the archaeology and art history of Egypt, Mesopotamia or the Far East. These positions are very difficult to fill, because few students, at least in the United States, have the patience and determination to qualify themselves in this combination of studies.

Some archaeologists have been hired in recent years to teach anthropology or Classics in junior colleges, but there are no such opportunities in secondary schools. Consequently, the M.A. degree, which primarily qualifies the holder to teach at the secondary school level, is of no direct value to an archaeologist.

The federal and state governments support a certain amount of archaeological research in fulfilment of their responsibility for the preservation of antiquities, the care of historical monuments, and the maintenance of archaeological sites as places of public interest in national or state parks. These programs provide some regular positions for those interested in North American archaeology, but the number of positions is limited. The National Park Service represents the federal government in this field. Some state park services hire archaeologists, and some states have a position of State Archaeologist. Since 1946 some federal and state funds have been available for the emergency excavation of sites to be flooded by new dam construction, and qualified archaeologists have been hired to direct this work under the River Basin Surveys program of the Smithsonian Institution. Private utility companies are now often required to furnish funds for salvage work of this kind before constructing dams and power lines. Salvage work is sometimes undertaken before the construction of highways and pipelines as well. Whether financed by public or private sources, much salvage archaeology is done on a contract basis by members of the staffs of local universities and museums. These projects increase the opportunities for field work but do not create many new regular jobs.

It may be noted that research on historic monuments and sites of actual or potential public interest is a kind of "applied archaeology," because it increases the resources of the tourist business. Nevertheless, the private businesses which profit from increases in the tourist

trade have contributed little directly to the support of the archaeological work which makes local sites intelligible and interesting to the visitor. Work of this kind tends to be regarded as a responsibility of government, like the provision of bathing facilities at public beaches.

Much local archaeology in the United States and Europe is done by amateurs working under the auspices of state and local archaeological societies or in collaboration with a museum. They are usually business or professional people who have learned the methods of archaeological research by reading and participating in organized excavations and who devote their spare time to research without pay. These amateurs must be sharply distinguished from the more numerous plunderers or pot-hunters who loot archaeological sites in order to sell the specimens found, or out of idle curiosity. The plunderers are a public menace, and their activities destroy archaeological evidence which can never be replaced. The genuine amateur archaeologists, on the other hand, deserve every encouragement. They have made many valuable contributions to our knowledge of European and North American archaeology.

American archaeologists whose field of interest lies outside the United States depend on research grants made by foundations or on the generosity of private benefactors for funds to pay the expenses of their field work. The money is usually raised in the name of the university or museum for which the archaeologist works, and, as we have noted, the institution must provide a leave of absence for the time he will be in the field. Occasionally an American archaeologist will enter the service of a university or museum in the country where his research interest lies in order to have more frequent opportunities for doing field work. Such service is a valuable experience, but it is likely to be difficult to arrange, since in most other countries there are even fewer positions for trained archaeologists than there are in the United States, while there is certainly no lack of local candidates for the positions.

Because most jobs involve either university teaching or museum work, a prospective archaeologist should have the temperamental qualifications for one or the other of these kinds of work and should plan his studies with the kind of position he wants in mind. A general requirement for research in any field is intellectual curiosity, an interest in asking questions and looking for answers to them. This curiosity should be combined with impartiality and suspicion of conclusions presented without fair discussion of the evidence. Field work demands some special qualifications. An archaeologist should be able to stand a considerable amount of physical discomfort without its interfering with his work or making him excessively irritable; he should be a methodical and sys-

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Applied archaeology in Peru. Puruchuco, a fifteenth-century villa in the valley of Lima, restored for public exhibition by Arturo Jiménez Borja and Francisco Iriarte Brenner between 1953 and 1958. *Above and right:* Details showing the villa before and after restoration. The walls shown are built of tapia; some unfired brick was used in other parts of the building. The restoration is painstakingly accurate, and the repairs are made in such a way that they can easily be distinguished from the original construction. Photographs courtesy A. Jiménez Borja.

tematic worker; and he needs some degree of manual dexterity. Above all, he should have patience. Most of the time an excavation is dull routine, and the work goes very slowly. Some spectacular discoveries may be made, of course, but they are likely to be a lot less frequent than the disappointments.

TRAINING FOR A CAREER in archaeology involves years of study, and the earlier a student decides that he wants to become an archaeologist the better. Much can be done

even in high school to plan a program which will make later study more effective. A student should make an opportunity to talk over his interest and problems with a professional archaeologist as soon as he is reasonably certain that his interest is serious. It is worth a trip to the nearest university or large museum in order to arrange such a conference.

In high school a program should be laid out which will provide training in background subjects. In the first place, it is important for every archaeologist to write



At the Point of Pines ruin, in the mountains of east-central Arizona, students of the University of Arizona Summer School are finishing the clearing of a room in a section built about 1280-1290 and destroyed by fire soon after. The students have done all the digging themselves, first with picks and shovels, then with small tools and brushes. They are also responsible for making notes and plans, as well as for the laboratory processing of the material found. Photo courtesy Arizona State Museum.

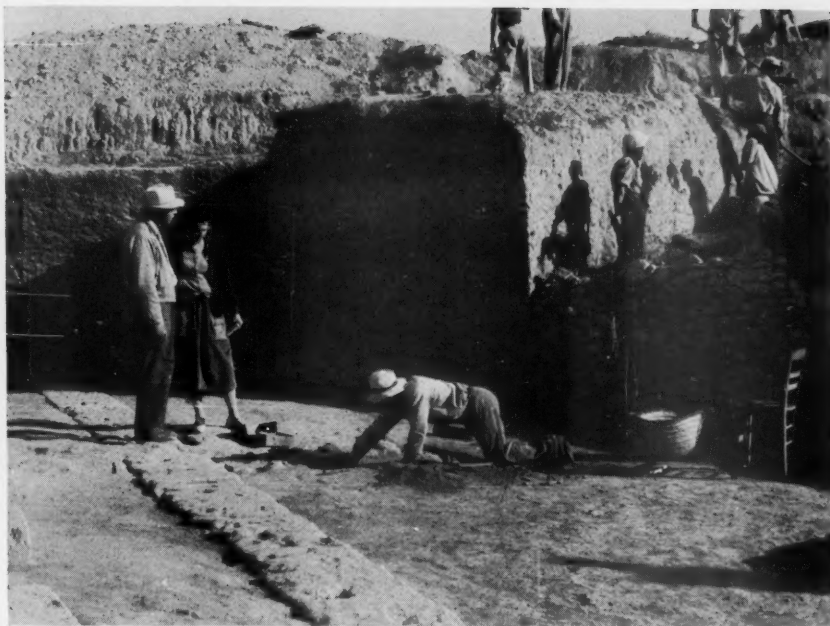
Archaeology Career continued

well and easily, since a large part of his research time is actually spent in writing up notes on what he is finding and in preparing reports for publication. Next, foreign languages are necessary. Most American universities require graduate students to pass reading examinations in French and German, and these languages are especially important to archaeologists, since there is a large and excellent archaeological literature in each of them. If the student hopes to do field work in some area outside of the United States other languages will be necessary. Some of them can be started in high school: Latin, for example, for prospective Classical archaeologists, or Spanish for those interested in Central or South America. Geometry and trigonometry are valuable for map-making, which is an important activity in every excavation. In his spare time the student should pick up some camping experience, do some reading on the area he is interested in and on general archaeology, and study the collections at any museum which he can manage to visit.

On admission to college the student should consult the adviser for the department of anthropology or whatever

other department handles the archaeology of his area of interest and do so at the earliest opportunity, even though the regulations may not require it. Most colleges require students to devote a year or two to general studies before they are formally enrolled in a major subject, and careful planning of the program during this period will give the student a better basis for later concentration. The prospective archaeologist should continue his program of language study and English composition and should take some elementary science courses. Chemistry, geology and palaeontology are especially useful. Courses in history and in the history of art are also to be recommended. Care should be taken to fulfil the prerequisites for more advanced courses which the student wants to take later. For example, a course in elementary Hebrew may be a prerequisite for Assyrian and Babylonian, languages which are needed by archaeologists working in the Mesopotamian field.

At some time during his preparation the student should get some instruction in typing, photography, freehand and mechanical drawing, and simple surveying. These are all skills which are needed in archaeological field work in making records of what is found. An



Excavations in progress in the Theater of Isthmia, near Corinth, Greece. Here a University of Chicago expedition has been working since 1954 to uncover the sanctuary of Poseidon, where the famous Isthmian Games were held. Professor Oscar Broneer, director of the excavations, and an assistant are standing on the theater's proscenium sill. Photo courtesy Isthmia Expedition.

archaeologist does not need all the skill of a professional surveyor or draftsman, but he should be able to make a competent map or measured drawing.

Specialized training is usually provided in the last two years of college and in graduate school. Except for languages, the whole program of specialized training can, indeed, be put off until graduate school without very much loss of time. Hence the prospective archaeologist can get a satisfactory undergraduate education at almost any college with high academic standards. He should, if possible, major in the field in which he expects to do graduate work. If, however, the college he is attending has no department in his immediate field of interest (anthropology or Oriental languages, for instance) a major in some related field such as art, history, geology or geography would be the best second choice. Whatever his major subject, the student should make every effort to maintain a high academic standing so as to qualify for admission to graduate school. If the college he attends offers an honors program in which training in original research is offered, he should try to enrol in it.

The choice of a graduate school is very important, and the student should discuss the problem with an archae-

ologist in his own field of interest sometime in his senior year. It is worth traveling to the nearest large university in order to do this, but if such a trip is impossible the inquiry can be made by correspondence. The problem is that no single university has specialists in all phases of archaeology, and for some fields there may be only one or two universities in the whole country where specialized training is available. The choice of fields covered at any given school will vary from time to time also as older teachers retire and are replaced by younger men whose interests are different, or as a teacher moves from one university to another to accept a job at a higher rank. It is important for the student to get up-to-date information about the situation in his own field of interest. A student interested in going into museum work may find it advisable to choose a university which gives courses in museum methods or one located near a large museum where such courses are offered.

AS NOTED above, most university anthropology departments offer a course in archaeological field methods, and there are in addition some excellent manuals which provide information on the techniques of excavation and



A difficult feat in excavation is to trace earth floors and locate walls of perishable materials by observing differences in the texture and color of the soil. Amateur archaeologists of the Cohannet Chapter of the Massachusetts Archaeological Society demonstrated their skill at this problem in 1957 at Wapanucket No. 6, a village site of about 2000 B.C. in Middleboro, Mass. The picture shows part of the entrance of Lodge No. 3, a circular structure about ten meters in diameter. The locations of the post-holes are marked by stakes and the line of the wall by chalk. Photograph courtesy Maurice Robbins, director of the excavation.

READING LIST

The following journals are selected for mention because of their broad area coverage.

ARCHAEOLOGY. An illustrated quarterly specializing in popular but responsible articles on the archaeology of all parts of the world, published by the ARCHAEOLOGICAL INSTITUTE OF AMERICA at 5 Washington Square North, New York 3, New York. Subscription \$5.00 a year; with annual membership \$15.00; with student membership \$7.50.

ANTIQUITY. A quarterly journal dealing with archaeology in general but with some emphasis on Old World prehistory. Published by H. W. Edwards, Ashmore Green, Newbury, Berks., England. Subscription \$5.00 a year.

AMERICAN ANTIQUITY. A quarterly journal specializing in the archaeology of the New World, with occasional articles on Oceania and Asia and on archaeological method and theory. Subscription is by membership in the Society for American Archaeology, which publishes the journal, and the dues are \$8.00 a year. Requests for membership should be addressed to the Secretary, whose name and address may be secured from a recent issue. In 1960-61 the Secretary is Dr. Joe Ben Wheat, University of Colorado Museum, Boulder, Colorado.

There is an extensive and rapidly growing popular literature on archaeology, but much of it is inaccurate and sensational. Books and magazine articles which give the reader the impres-

Archaeology Career continued

recording. A selection of these manuals is included in the reading list at the end of this article. However, skill and judgment in the use of archaeological methods can be developed only through actual field experience. There are several ways in which a student can acquire experience of this kind. One is through organized summer field schools. A number of American universities, particularly in the Mississippi Valley and the West, offer summer session courses in which the students take part in the actual excavation of a local site. The usual fees are charged, and the students pay their own living expenses. These summer courses are usually open to both undergraduates and graduate students. For students specializing in Classical or Near Eastern archaeology, the best opportunities for learning field method are provided by the Institute of Archaeology, University of London, and certain of the schools of archaeology affiliated with the ARCHAEOLOGICAL INSTITUTE OF AMERICA. These are: the American School of Classical Studies at Athens, the School of Classical Studies in the American Academy in Rome, and the American Schools of Oriental Research, with branches in Jerusalem and Baghdad. Graduate students are admitted for a year or more of study and opportunities are provided for taking part in organized excavations. In each of these schools some fellowships are available for outstanding students. Further details of

sion that archaeological field work is a glorified search for buried treasure are especially pernicious, since their effect is to encourage looting and destruction of archaeological sites by idle curiosity seekers. Among books on archaeology which may be relied upon to be responsible and informative are those published in the Pelican Books series (published by Penguin Books Ltd., Harmondsworth, England, and Baltimore, Maryland) and those which comprise the series *Ancient Peoples and Places* (published in the United States by Frederick A. Praeger, New York). The student interested in reading about the archaeology of particular areas can begin with books in these series and use their bibliographies as a guide to further reading. The book review sections of the three journals listed above will also help the student find good popular and technical books in his field of interest. The following list calls attention to some useful books on what archaeologists do and on certain aspects of the history of archaeology.

Bibby, Geoffrey. *The Testimony of the Spade*. Alfred A. Knopf, New York, 1956. (A vivid chronicle of great discoveries in European prehistoric archaeology which gives much insight into archaeological research methods.)

Braidwood, Robert J. *Archaeologists and What They Do*. Franklin Watts, Inc., New York, 1960. (Just what the title says; simply written and informative.)

Clark, Grahame. *Archaeology and Society: Reconstructing the Prehistoric Past*. Harvard University Press, Cambridge, 1957. (The emphasis is on problems of European prehistoric archaeology, but most of the problems are common

their programs can be found in Appendix III of Kenyon's book cited in the reading list below.

Other opportunities for field experience are offered by the weekend excavations carried out in many parts of the United States by the state and local archaeological societies. These programs of weekend excavation depend on volunteer labor, and anyone with a serious interest in the work is usually welcome. Whether the student is interested in local archaeological problems or not, work of this kind is a very valuable experience.

To keep in touch with new developments it is important to subscribe to and read one or more archaeological journals. Three of general interest are named in the reading list below. There are many other excellent journals devoted to the archaeology of particular areas, and a student should ask his adviser about the journals which deal with his particular field. Membership in archaeological societies which meet near the student's place of residence is also a stimulating experience and provides opportunities to meet people whose advice will be helpful. The ARCHAEOLOGICAL INSTITUTE OF AMERICA has forty-eight branches in American cities and university communities which hold periodic meetings to hear lectures, and most of the state archaeological societies have similar programs.

IN CONCLUSION, some comments on choosing an archaeological field may be added. Specialization is necessarily

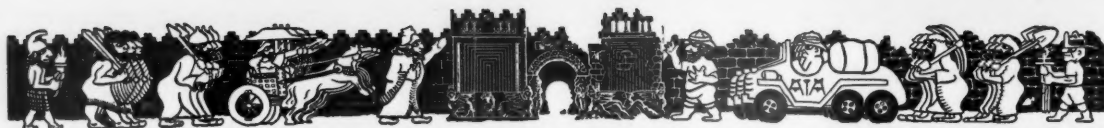
by area, as in the humanities, rather than by subject matter, as in the natural sciences. Archaeologists do their best work in an area where they know the cultures and languages and are familiar with the details of earlier research. Occasionally an archaeologist changes areas, but most people become so interested in the research problems of the field in which they were first trained that they stay in it. In some areas a further specialization by subject matter is possible. In Classical archaeology, for example, there are specialists in inscriptions, in coins, in pottery and in architecture, as well as people with a general interest in the whole field. Because the program of training for each area is different, it is important for the student to choose an area of specialization early and stick to it. For most students the choice of an area is not a serious problem, because they become interested in archaeology through reading or studying about some particular area. For the few who start with a general interest the choice may be difficult, but it need not be a matter of serious concern. There are important archaeological problems in every part of the world and not enough people working at them. Even in fields where a vast amount of work has already been done the progress of discovery brings new problems to light, and earlier conclusions need constant revision. As archaeologists devise more refined research methods, too, old problems can be reopened. The problems vary in different areas, but they are all interesting.

- to many other areas all over the world.)
- De Laet, Sigfried J. *Archaeology and its Problems*. Translated by Ruth Daniel. The Macmillan Company, New York, 1957. (A general discussion of archaeological methods written from the point of view of archaeology in Belgium; it makes an interesting comparison with other works listed which have a British or U.S. background.)
- Heizer, Robert F. (editor). *The Archaeologist at Work: A Source Book in Archaeological Method and Interpretation*. Harper & Brothers, New York, 1959. (A valuable collection of selections from the literature of archaeology.)
- Heizer, Robert F. (editor). *A Guide to Archaeological Field Methods*. Third revised edition. The National Press, Palo Alto, 1958. (Includes a detailed bibliography of the subject.)
- Kenyon, Kathleen M. *Beginning in Archaeology*. Revised edition, with sections on archaeology in America by Saul S. Weinberg and Gladys D. Weinberg. Frederick A. Praeger, New York, 1953. (A new revision is to appear in June, 1961.)
- Lloyd, Seton. *Foundations in the Dust: A Story of Mesopotamian Exploration*. (Pelican Books A336.) Penguin Books, 1955. (The author has a sympathetic interest in modern as well as ancient Iraq.)
- MacKendrick, Paul. *The Mute Stones Speak: The Story of Archaeology in Italy*. St. Martin's Press, New York, 1960. (An account of significant discoveries in the archaeology of Italy with valuable comments on research methods.)
- Martin, Paul S. *Digging into History: A Brief Account of*

- Fifteen Years of Archaeological Work in New Mexico*. Popular Series, Anthropology, No. 38. Chicago Natural History Museum, Chicago, 1959. (The author's research, with information on how it was done and how his conclusions were reached.)
- Wheeler, Sir Mortimer. *Archaeology from the Earth*. Clarendon Press, Oxford, 1954. Also published as Pelican Book A356. (The best single account of archaeological method.)
- Wissler, Clark. *The Archaeologist at Work: How Science Deciphers Man's Past*. Science Guide no. 116. American Museum of Natural History, New York, 1946. (Reprinted from *Natural History*, Vol. 51, no. 3, 1943.)
- Woolley, C. Leonard. *Digging up the Past*. (Pelican Book A4.) Penguin Books, 1937. (Still the best introduction to archaeology for someone who knows nothing about the subject.)

The following publications on teaching and museum careers may be recommended.

- Barzun, Jacques. *Teacher in America*. Little, Brown and Company, Boston, 1945. (Discussion of some of the problems of college and university teaching which gives a good idea of what a career in this type of teaching involves.)
- Careers in Museum Work*. Careers Research Monographs, Research No. 91. Second edition. Institute for Research, Chicago, 1950. (Advice to students considering a museum vocation.)



ARCHAEOLOGICAL NEWS

Obituaries

It is with the greatest regret that we record the deaths of these eminent scholars:

J. H. ILIFFE, authority on Roman pottery, formerly Director of Antiquities in Palestine, more recently Professor at the University of Liverpool, died October 18, 1960;

TATIANA WARSCHER, known particularly for her *Codex Typologicus Pompeianus*, a compendium of information on the excavations of Pompeii, died December 8, 1960;

KARL LEHMANN, director of excavations on the island of Samothrace, authority in many fields of Greek and Roman archaeology, Professor at the Institute of Fine Arts of New York University, died December 17, 1960;

FATHER LOUIS H. VINCENT, O.P., long distinguished for his archaeological research in the Holy Land, editor of *Revue Biblique*, died December 30, 1960;

EUNICE WORK, specialist in Greek numismatics, Professor Emeritus of Wheaton College, died January 3, 1961;

ETIENNE DRIOTON, authority on ancient Egypt and for many years Director of the Department of Antiquities of Egypt and of the Egyptian Museum in Cairo, died January 19, 1961.

Sixty-second General Meeting of AIA

About 650 members of the ARCHAEOLOGICAL INSTITUTE OF AMERICA and the American Philological Association registered at their joint meeting, held at the Statler-Hilton Hotel, Hartford, Connecticut, December 28-30. The Council of the Institute, including representatives of the forty-eight local societies, met on Wednesday morning, the 28th. Professor Jotham Johnson, of New York University, was elected President of the Institute, and Dr. Richard H. Howland, of the Smithsonian Institution, Vice President.

The first session for the reading of papers began Wednesday afternoon. Saul S. Weinberg described excavations at Elateia, in Central Greece, where he uncovered a well stratified Neolithic site (see *ARCHAEOLOGY* 12 [1959] 282-283). John L. Caskey followed with a report on excavations at Agia Irini on the island of Ceos (*ARCHAEOLOGY* 13 [1960] 290). J. Walter Graham discussed the question as to whether the "lustral chambers" in Cretan palaces were actually bathrooms or were confined to ritual use, and concluded that they could have served both purposes. Emily T. Vermeule reported on the exploratory excavations conducted by Professor Marinatos, whom she assisted, at Mycenaean sites in the western Peloponnese and on the island of Cephalonia. At Mouriatadha (perhaps ancient Pteleon) an entire Mycenaean provincial border kingdom was sur-



Investigating a wreck off the Turkish coast. Diver places object in plastic bag and then in basket to be hauled up.

veyed and partially excavated. The complex includes city walls, private houses, a tholos tomb and other structures of the Late Helladic period.

George F. Bass described underwater excavations off the coast of Turkey. These are to be presented in a coming issue of *ARCHAEOLOGY*. Charles W.

Goff spoke on the "Analysis of the Osseous Remains of Christobal Colon, Admiral of the Ocean Sea." By special permission he was able to view the remains now entombed in the capital of the Dominican Republic, and concluded that they are indeed the bones of Columbus. They indicate "a robust man with muscular body build, about sixty-eight inches tall, broad-shouldered, large head and evidence of considerable gouty osteoarthritis." The session concluded with a paper by Robert H. Brill on a new method of dating glass (see page 18).

In the evening the AIA met with the APA in the customary joint session, at which APA President Louis A. McKay spoke on Senecan tragedy.

The second session, on Thursday morning, opened with a paper by Clark Hopkins on the solar aspect of the Greek Gorgon and the symbolism involved. Bernard Goldman followed with a similar theme, discussing a Luristan figure which may be a link in the Gorgon's lineage. Recent excavations at Ghassul, northeast of the Dead Sea, were reported by Robert North, S.J., who said that the main purpose of the excavation was to provide a sequence chart of pottery types from all the small tells of Ghassul, in order to establish the relationship between pre- and post-Ghassulian on the one hand, and the typical pottery of Ghassul itself on the other. Secondary results were the verification of the fact that Ghassul lacks Chalcolithic characteristics prominent elsewhere, and the discovery of two frescoes in Ghassul's brilliant and unique style.

Underwater research in Israel, organized by Edwin A. Link, was reported by I. Ben-Dor. The ancient harbor of Caesarea was located, and remains of the cargo of a first-century ship were found in the Lake of Galilee. Excavations at Sardis, presented by George Hanfmann, are featured in this issue. Axel von Saldern described

the Roman and Byzantine glass found at that site. Margaret Thompson discussed certain magistrates' names on Athenian coins of the New Style period. She concluded that the names were those of wealthy citizens who contributed toward the expenses of the coinage in a sort of group liturgy.

At the third session, on Thursday afternoon, Henry S. Robinson reported on excavations at Corinth, 1959-60, which took place in the southwest corner of the Agora and were confined to the Byzantine levels. Further excavations near the "Baths of Aphrodite" were reported in *ARCHAEOLOGY* 13 (1960) 291-292. James R. Wiseman discussed a trans-Isthmian fortification wall, built probably in anticipation of the Gallic invasion of 279 B.C., which was partially traced by the University of Chicago Expedition to Isthmia in 1960. The wall runs northwest and west from the sea at Cenchreae, leaving the sanctuary outside the fortifications.

V. Clain-Stefanelli presented a study of ancient coin dies, using a limited series of gold coins issued by the Greek city-state of Callatis (on the Black Sea) as the basis of his study. Frequent changes in the reverse dies give clues to the chronology of the coins, which can be dated between 93 and 85 B.C. Countermarks appearing on "Greek Imperial" coins of western Asia Minor during the mid-third century were discussed by Tom B. Jones, who showed that these were related to the monetary crisis of the period, and that they can be attributed to specific towns. Herbert W. Benario presented reasons for advancing the date of the *Feriale Duranum* from some time after November 7, A.D. 224, to 223. Otto J. Brendel discussed the various portraits which have been identified as Marc Antony, removing two from this group and adding another. Two different stylistic trends agree with the numismatic evidence.

At the Joint Annual Banquet on Thursday evening an address entitled "Laws and Law Courts in Ancient Athens" was presented by Professor Homer A. Thompson, Director of Excavations in the Athenian Agora. He offered evidence for the presence of the judicial branch of the government in the Agora region, in addition to the executive and legislative branches. This evidence consists of fragments of legal documents as well as remains of



Reconstruction of a fresco representing a tiger, recently found at Ghassul, in Jordan. Photograph courtesy of the Pontifical Biblical Institute.

buildings which served the courts for meetings and other purposes.

Sterling Dow opened the fourth session, Friday morning, with a paper entitled "The Walls Inscribed with Nikomakhos' Law Code." He was followed by John H. Young, who discussed his exploration of the Sunium area with a view to clarifying Pausanias's description, showing that Pausanias located most points correctly despite his omission of the Temple. James R. McCredie presented a report (jointly with Arthur Steinberg) on the excavation of a fort in Attica (Porto Raphti) which disclosed coins of Ptolemy II Philadelphus and is probably to be associated with the Chremonidean War (265-261 B.C.), when Ptolemy II was allied with Athens against the Macedonians. Cornelius C. Vermeule dealt with a colossal female statue of the Roman period which is on an island in the harbor of Porto Raphti. He showed that this colossus was a geographical personification and that it, as well as a smaller statue, probably served as a lighthouse. In a joint paper, John Travlos and Evelyn B. Harrison discussed a new arrangement of the Eleusis copies of the sculptures on the west pediment of the Parthenon.

The investigation of the Crusader fort on the height known as El-Habis, at Petra, was reported by Philip C. Hammond. It was found that this fortress was erected after the original fortification of the area in order to command the major north-south commercial route. Daniel E. Woods described the excavations of 1960 in Mallorca, which were continued at ancient Pollentia and in the necropolis

of Son Real. At Pollentia the excavation of a Roman house of the Augustan period was completed; it was found to have been destroyed in the third century, and again in the fourth.

The fifth and final session, Friday afternoon, began with a paper by Clotilda Brokaw on the chronology of the Protoattic style of pottery. She stressed the value of external evidence in attempting to establish the date of the beginning of this style. Brian F. Cook discussed red-figured lekythoi by the Berlin Painter, demonstrating that a detailed study of the shapes of the vases can lead to significant conclusions. G. Roger Edwards emphasized the importance of establishing absolute chronology for Hellenistic pottery and showed how certain deposits, especially those found in the Agora, may be used for this purpose.

Ann K. Knudsen's subject was the relation between the pottery and metalware industries, as evinced by examples of both found at Gordion. She showed that examination of the Gordion finds may provide a basis for a general study of this relationship. Evelyn B. Harrison discussed the date of the marble Nikai of the Stoa of Zeus, about which there has been disagreement, and came to the conclusion that they were added to the stoa during the first decade of the fourth century B.C. In the final paper of the meeting Seymour Howard showed evidence that the Laocoon group may have been a prototype rather than a copy of figures in the frieze of the Pergamon Altar. He suggested that the group was erected after the battle of Magnesia, some thirty years before the Altar was begun.

Excavations at Biblical Sites

The year 1960 was an active one for the American School of Oriental Research at Jerusalem. Three excavations of major importance were all in process during the summer months—at Beitin (Bethel), el-Jib (Gibeon) and Balata (Shechem). The School facilities were taxed to the maximum, with as many as forty expedition members housed there and fifty-two taking meals. Yet the crowded conditions did not appear to impede the efficiency of the excavation work. The outstanding success of the three expeditions can be appreciated as one reads the summaries of results by each excavation director. We are privileged to quote these (in slightly abridged form) from the September issue of the School's *Newsletter*.

The Beitin excavation, which began May 23, completed its work July 19. Professor James L. Kelso, director of the expedition, summarizes the work of the fourth campaign as follows:

The Beitin expedition of the American School and the Pittsburgh Theological Seminary has concluded a most successful campaign, locating the old Canaanite high place at Bethel which was used as early as 2500 B.C., and finding the blood of the sacrificial animals still staining the white limestone. Directly over the high place a temple was erected to the great god El. Three courses of the old temple wall are still intact and the doorway which opened to the rising sun is still visible. The temple appears to have been in use as late as Abraham's day. About the time of Joseph, however, the city's fortifications were expanded and a massive wall 3.60 m. wide surrounded the city. It was erected of well dressed stone on the exterior, with interlocked stones for the core. Near the spring of the modern village four meters of the old city wall were uncovered. In some places this wall continued in use as late as Roman times.

The Hyksos builders of Joseph's day introduced a new type of pedestrian city gate as an entrance to the palace grounds. At the northwest corner of the city they built a long rectangular gateway. Visitors to the king came up three stone steps and entered a wide gate; then they walked fifteen meters westward along a narrow corridor to the end of the room; here

they made a complete U-turn and climbed up six stone steps, after which they entered another corridor going eastward. Then they turned south and went through the great city wall to the royal buildings.

The western city wall was built by two construction teams, one working from the south, the other from the north. The point of juncture is plain, as the walls were on a slightly different alignment. Another section of the old city wall runs directly under one of the houses of Beitin.

Professor James B. Pritchard, director of the University of Pennsylvania expedition at el-Jib, reports the following results of the fourth season, which lasted from June 15 through July 30:

The principal excavation was in Area 17, where in 1959 there had been found an industrial installation for the making of wine and an elaborate Roman tomb. Here twenty-one plots, 5 x 5 meters, were dug to bedrock. In this area there were three principal periods of occupation, Iron I, Iron II and Roman, with scattered traces of debris from the Early Bronze and the Middle Bronze periods. The most significant constructions found in the area belong to the Iron II period and consist of bell-shaped vats hewn in the solid rock, similar to those found in 1959 and interpreted as storage vats for wine which had been placed in large storage jars. Twenty-eight of these vats were found this season. Four which had been plastered were obviously intended to hold wine in bulk, possibly in the fermenting stage. About half of the industrial area opened this season seems to have been an open court; the remainder was divided into rooms. East of this area the city wall of the Iron Age was discovered. This corresponds in thickness and construction to the city wall discovered in previous seasons.

The most important discovery of the season was the cemetery on the west side of the tell. Here twelve shaft tombs were found cut in the relatively soft limestone of the terrace. The shafts were cylindrical and usually round in plan, and domed at the top. Re-use was evident. Two of the tombs contained pottery which seems to belong to the Late Bronze period, but most were filled with Middle Bronze II pottery of the type known

from the Jericho tombs. Two of the richest tombs had been re-used in the Late Bronze period.

A sounding was made in Area 10, where there are more than four meters of debris. Below some Turkish burials was a series of Iron II floor levels, and beneath these was a considerable deposit of Middle Bronze II material, including sixteen crushed storage jars on one floor. Apparently the house had been destroyed by a general burning. Another sounding in the same area revealed a large building of the Iron I period. There is certainly an important public building here which can be excavated in a future campaign.

The third season of the Drew-McCormick-ASOR Expedition at Shechem took place July 2—August 13 with a staff of thirty-two led by Professor G. Ernest Wright. The interesting results of this campaign will be reported in a future issue of *ARCHAEOLOGY*.

AAAS Symposium on Salvage

The following report was provided by Dr. John L. Cotter of the National Park Service. We are especially pleased to announce that the papers presented at this important session, supplemented by illustrations, will appear in our Winter 1961 issue, which is to be devoted exclusively to the pressing problems of salvage archaeology.

In an effort to draw a focus upon the increasingly commanding picture of what is loosely known as "salvage archaeology" in the world today, a symposium chaired by the writer and enlisting the contributions of ten specialists was held in New York, December 29, 1960 at the Section H meetings of the American Association for the Advancement of Science. The results proved to be considerably at variance with the familiar discursive half-hour papers, with slides, delivered on such occasions. The papers were limited to fifteen minutes, and some were shorter. Only one was illustrated, if we except a second which employed a single slide. Discussion was brief.

The net effect of the symposium, which opened with a "world view" of the subject by Dr. John O. Brew, Director of the Peabody Museum at Harvard, was to put a rift in the foliage of ethnocentrism which has overshadowed archaeological salvage

efforts in the United States. This country is not first nor necessarily foremost in these efforts. In fact, nearly every nation in the world with the means and ambition to foster self-determination is jealously conserving its cultural heritage and the physical vestiges which demonstrate it to its citizens. From Ghana and Nigeria to the People's Republic of China (where, we are told, 227,530,000 visitors in 1958 visited museums and historic exhibits) and from Peru to Mexico and Canada, the emergence of the theme of national cultural heritage is sending archaeologists, historians, museum specialists and preservationists into action at thousands of sites. As these efforts are redoubled while national consciousness—for better or worse—mounts in intensity throughout the world, novel and more efficient methods of field archaeology are being developed.

On a technical level obviously beyond the scope of most professional archaeologists are the new resistivity and magnetic field recording devices and laboratory equipment for scintillation analysis. Richard E. Linington, now assisting the University Museum in Philadelphia to develop its archaeological research laboratory, described the operation of the proton magnetometer. He cautions the profession that the archaeologist who uses this equipment requires exacting training and experience in the realm of physics and must be able to relate this to his peculiar problems.

In commenting upon a world view of salvage archaeology, Dr. Brew called attention to the socio-economic phenomenon of early and continued concentration of human occupation of great river valleys, and the recording, in the United States alone, of over ten thousand sites in areas to be flooded by the building of dams. In the case of Egypt, UNESCO and specific western institutions have been welcomed as contributing to an international effort to preserve Egypt's—and coincidentally western civilization's—cultural heritage. Nor has the Soviet Union been unaware of site salvage in respect to the Aswan project, to say nothing of the extensive and early program to salvage sites of archaeological significance within the Soviet Union itself. As for China, Mr. F. Ridley points out that no gloss of propaganda or exaggerated claims can obscure the fact that Communist China is fostering

pride in its national heritage—by the theme of "revolutionary history"—through a planned program of archaeological salvage and historic site preservation. For example, the ancient city of Loyang is being maintained intact as a historical monument, while the modern industrial city, many times larger, rises nearby.

The remarkable challenge of the rapid modernization and industrialization of large urban areas in Mexico, together with development of the na-

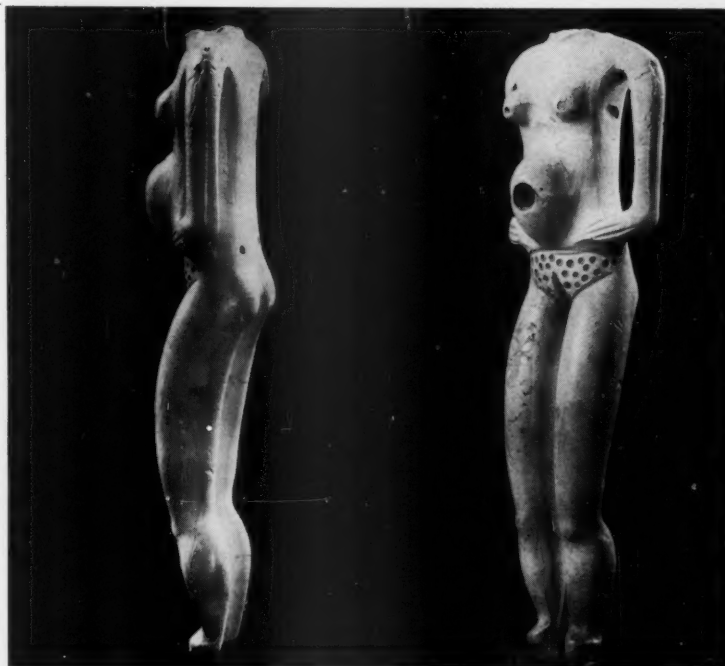
tionalized petroleum industry, has made nearly impossible demands upon archaeologists of that nation. Luis Avelleyra's plea was for the training of a cadre of field workers on a national scale so that the estimated twenty thousand prehistoric and historic sites in Mexico can be properly conserved. Canada, with a more limited problem, is nevertheless hard pressed to find archaeologists for site salvage, although plans are now materializing for the extensive restoration

Unique Ivory Figurine

To Jean Perrot, who for some years has been directing excavations at various sites in Israel under the auspices of the French Archaeological Mission (see *ARCHAEOLOGY* 12 [1959] 9-15), we owe the following account of the unique ivory figurine illustrated here. Mr. Perrot found it recently at Safadi, near Beersheba.

The figurine, without the head (broken off), measures 11 cm. in height; it represents a pregnant woman. The position of the hands on the hips is similar to that of the male statuettes discovered earlier. In technique it also resembles the other statuettes; the legs have been divided by sawing, while

the arms were detached from the body by a series of perforations whose remaining partitions were cut away. Also indicated by drilling are the hair of the pubic region, the navel, the tips of the breasts and the lumbar dimples. The extreme exaggeration of the umbilical perforation suggests that it may have had a special function. Although when viewed *en face* this figurine has the same rigid attitude as the statuettes, in profile a slight movement of the legs can be noted. In contrast to the male statuettes, the thigh is long and the calf short; the modeling is delicate and the limbs well formed. This figurine is one of the finest pieces in the series of Beersheba ivories. It dates from about 3500 B.C.



of historic sites, notably in areas where the economy is depressed, in order to provide work and to draw visitors from all parts of North America.

Messrs. Corbett, Wasley, Ritchie, Aveyra and Forbis all noted the continuing and chronic dearth of trained field workers and funds for archaeological salvage in North and Central America. Ivor Noel Hume pointed specifically to the one definite resource which may yet be available and undeveloped. This consists of able and enthusiastic amateurs, organized into functioning state, county and local archaeological societies, who may be called upon to volunteer their services in survey and salvage operations. The obligation of professional archaeologists, notably those connected with federal, state and private research institutions and agencies, is to foster among these groups of amateurs an appreciation and understanding for first-rate research. The fact is self-evident that it is the enthusiasm of the interested layman which induces state and local government to support archaeological conservation. The history of the organized use of volunteered or nominally compensated services of interested amateurs in Great Britain by trained archaeologists is truly notable, and provides a clue to the more intelligent and productive use of the services of amateurs in this country.

There is a simple reason why the amateur has not heretofore been called upon more effectively in this country: he came into the archaeological sanctum through the back door as a pot-hunter or a self-publicized and self-taught "archaeologist." The predatory pot-hunter who destroyed sites became scarcely less a target for the professional archaeologist's ire than the self-proclaimed expert who managed to sell his services to architects and restoration specialists not sufficiently well informed to seek professional assistance. This sensitive and rather sterile situation has been somewhat relieved during the last score of years by the welcome extended to amateurs by the professional archaeological societies and the participation of professionals in local archaeological societies whose membership is made up chiefly of amateurs. Thus, the next step toward the utilization of the resources of competent amateur field workers in archaeological surveys is ready to be taken. This symposium may help.



Priest of Palmyra

A recent acquisition by the City Art Museum of St. Louis is this fine portrait of a young priest from the city of Palmyra, presented by Miss Martha I. Love. Carved in high relief, of calcitic marble, the portrait represents a young man wearing a tall headdress and a tunic fastened with a brooch. On the background, on both sides of his head, is an inscription in Palmyrene, a western Aramaic dialect, which gives a date of A.D. 141. This excellent piece is characteristic of the sculpture of Palmyra, the ancient Syrian city located 130 miles northeast of Damascus, which was destroyed by the Romans in the third century.

Chicago Expedition to Egypt

The Oriental Institute of the University of Chicago is participating actively in the work of archaeological salvage in connection with the Aswan High Dam project in Egypt. A Committee has been set up, with Professor Keith Seele as Chairman and Program Director, to organize this new area of the Institute's activities.

The Institute has obtained a concession for an area around Beit el-Wali, some thirty miles south of the dam, and is engaged in an epigraphical and archaeological program in co-operation with the Swiss Institute of Egyptian Architecture and Archaeology. The epigraphical project, under the direction of Professor George Hughes, has already finished the photography of the Beit el-Wali site and is at present at work there with epigraphers and artists. The staff of the

archaeological project, under Professor H. Ricke of the Swiss Institute, has arrived at the site and is beginning work.

Professor John Wilson, Director of the Oriental Institute, has recently been in Egypt in connection with the project, participating as the American representative in the meeting of the Consultative Committee of International Experts of UNESCO in Cairo.

Egyptologists Meet in Moscow

As a supplement to the general report of the Congress of Orientalists, held in Moscow August 9-16, 1960 (ARCHAEOLOGY 13 [1960] 279-286), we present the following summary of the papers on Egyptian archaeology, which we owe to the kindness of Bernard V. Bothmer.

Traditionally, Section I of the International Congress of Orientalists comprises Egyptology, and the XXVth Congress was no exception. It was interesting to note that the first paper scheduled on the first day was to be read by an American. The sessions were attended by 40-60 participants, about equally divided between Eastern and Western countries. The atmosphere was very cordial, and the members of the USSR delegation went out of their way to put visitors from abroad at their ease. Especially notable was the unparalleled generosity with which access was given to the Egyptian antiquities in the great museums of Leningrad, Moscow and Kiev. Permission to take photographs was liberally granted, cases were opened on request and the material in storage was made accessible without hesitation; however, few of the visiting Egyptologists seemed to make use of these unusual opportunities.

Although most of the papers in the Egyptological section dealt with philological and historical problems, archaeology was well represented; as a matter of fact, the archaeological material was far richer than at the previous congresses of 1957 (Munich) and 1954 (Cambridge).

The most important new discovery presented—although few of those present may have realized it at the time—was contained in Alexander Badawy's (Lawrence, Kansas) paper on "The Harmonic System of Architectural Design in Ancient Egypt." This attempt

to discover the method of design was based on the analysis of more than fifty plans and elevations of architectural monuments from the IIIrd Dynasty to the Roman period. The method employed by the Egyptian architects seems to have been based on the use of constructional diagrams which gave the outline and the main subdivisions of the elements of the design and on a harmonic diagram, correlated to the former, which defined the proportions and details of the elements. Simple geometric figures—mainly the square and a few isosceles triangles—served to form the general outline. The isosceles triangle with the ratio base/height = 8/5 seems to have defined the harmonic proportions of the various elements. This triangle gives a very good approximation of both 0.618 and 1.618, the Golden Number of harmonic characteristics. In certain examples, primarily the two sanctuaries at Tell el Amarna (late XVIIIth Dynasty), the actual basic dimensions of the general outline in the plan render "in clear" the consecutive numbers of a summation series of the Fibonacci-Lamé type: 8, 13, 21, 34, 55, 89, 144, etc.

Winifred Needler discussed a funerary bed of the Roman period (perhaps third century) from Thebes, now in the Royal Ontario Museum. Its somewhat degenerate but very elaborate painted decoration contains scenes from the Book of the Dead, as well as a remarkable representation of the ogdoad. The owner and his wife, who appear numerous times among the gods, are drawn freely (usually frontally) in their everyday costumes. In the same scenes the deities, however, are portrayed and dressed in traditional Egyptian style. The accompanying hieroglyphic inscriptions are rather debased but generally legible. The man, whose unusual name is foreign, is consistently shown with fair hair and light complexion, while the woman, whose name is Egyptian, has distinctly darker features.

Käthe Bosse-Griffiths (Swansea) spoke on "Some Unpublished Finds from the So-called Tomb of Tiye" and Jean Leclant on the Egyptian collection of Strasbourg University which, in addition to the antiquities long known from Spiegelberg's publication (1909), comprises unpublished pieces acquired during the last forty years. Adolphe Gutbub discussed a monu-

ment in the Coptic Museum, Old Cairo, representing the rarely depicted god Heron. N. M. Postowskaya (Moscow) presented a well documented thesis that the royal tombs of the Ist Dynasty in Abydos may really have been cenotaphs. T. N. Sawelyewa (Moscow) discussed historical conclusions to be drawn from workmen's quarry inscriptions found on the blocks of various Old Kingdom monuments at Giza and Saqqara as well as in the nearby quarries.

Fritz Hintze gave an excellent report on the excavations of the Egyptological Institute of Berlin University in eastern Butana, island of Meroe, where the so-called Southeast Temple of Massawarat (Sudan) was cleared. The structure seems to have collapsed suddenly, possibly as the result of an earthquake; about six hundred decorated blocks with reliefs and inscriptions, buried in the sand face down, were recovered in perfect order. The temple was dedicated primarily to Apedimak, a lion god, although Sepinmeker is also featured. The workmanship of the reliefs is very good, and although the building must have been constructed about the beginning of the Christian era, the inscriptions (which are not Meroitic but in early Ptolemaic

style) mention the name of King Arnekh-amani, a contemporary of Ptolemy IV. The texts contain hymns to Egyptian as well as to Meroitic gods. For some of these the parallels from Egypt are of a later date, whereas one hymn (to Osiris), known only from the chapel of Ankhnes-neferibra at Karnak and from a statue base in Vienna, is used at Massawarat for the god Sepinmeker. The plan of the structure is rather complicated. The inside walls are decorated in low relief, the outside walls in sunken relief. The lower portion of the inscriptions was originally covered with gold foil.

B. H. Stricker read a paper on "A Female Statue of the Graeco-Egyptian Period" recently acquired by the Leyden Museum. This draped statue, of the middle to late Ptolemaic period, is restored from the knees down in a dark, almost black, stone of Italian origin. It is uninscribed, whereas a second draped female statue, without a head (also at Leyden), bears a dedicatory inscription in Greek.

Edith Varga (Budapest) reported on the preparation of a corpus of *bypocephali*, a much neglected part of Late Egyptian funerary equipment. She also read a paper by her husband, L. Castiglione, pointing out the dual-

ANEMONES AT EPIDAUROS

To me, there by the temple, healing came
As it had come to those in ancient days
With sacrifice and praise,
Time out of mind, for Aesculapius
Enshrined.

No votary, no offering in hand,
I hoped to find remembered flowers flung
Pomegranate red, blood red
As those first sprung
Where young Adonis, newly dead,
Was lying.

And they were there,
Buds opened by the wind
And by the wind dispersed, their petals flying,
Ephemeral yet permanent, in brave
Renewal; mortality denying—
And splendor of the fallen architrave
Outlying.

MARY WINTER

ism of Egyptian stelae of the Roman period which, within a traditional scene, represent the deceased in Hellenistic style. Bernard V. Bothmer read a progress report on the *Corpus of Late Egyptian Sculpture*, outlining the work undertaken by Herman De Meulenaere, H. W. Müller and himself during the last three years, and then spoke on "*Membra Dispersa*" of the numerous late sculptures which have been found to be divided between several collections. His report closed with a plea for more accurate recording and better publication of Egyptian statuary in general, so that the missing portions of fragmentary sculptures can be recognized without the necessity of working with the fragments themselves.

At the close of the sessions the delegate from the Sudan submitted a resolution calling on UNESCO and on individuals and institutions of all countries to divide more equitably between the United Arab Republic and the Sudan the personnel and monetary resources available for archaeological salvage work in the area threatened with submersion by the construction of the new High Dam south of Aswan. The Egyptological Section unanimously accepted this resolution.

ESAF Meeting

The twenty-seventh annual meeting of the Eastern States Archeological Federation was held in Toronto, Ontario, October 29 and 30, 1960. The Ontario Archaeological Society was the host, and most of the sessions were conducted in the Royal Ontario Museum. The registration was 147. At the dinner, James E. Anderson of the University of Toronto gave an illustrated talk on "Bones and the Archeologist."

Most of Saturday was devoted to two symposia, one on the Iroquois, the other on Projectile Point Classification. Excavations at the Miller site near Pickering, Ontario, as reported by Walter Kenyon, reveal a cultural phase about a thousand years old that contains both Iroquois and Woodland elements, suggesting that the former may have developed *in situ* and not have immigrated. Various good suggestions for projectile point typology were made, but no standard classification system has yet been generally accepted.

Ten contributed papers, most of

them reports on excavations, followed on Saturday afternoon and Sunday. These latter range from Ontario to Alabama, but most are in the Middle Atlantic states. Possibly the most interesting was a report by Don W. Dragoo of the discovery near Dover, Delaware, of a new site of the Adena culture. The typical artifacts, all made of Ohio materials, indicate an actual migration with carriage of treasured objects, and not trade. The age is estimated at about two thousand years.

Summer School of Archaeology

Each year the British Summer School of Archaeology meets at a different center, offering a series of lectures and discussions on a specific theme. In 1961 the School will convene August 12-19 at Cirencester, in the heart of the Cotswolds, where the problem under discussion will be the Roman Villa. The honorary director, as in former years, is Professor F. T. Wainwright. A course of lectures, popular in form but authoritative in content, will be given by distinguished scholars such as Professor I. A. Richmond, Mr. Graham Webster, Miss Joan Liversidge and others. Excursions will take members to all the important Romano-British sites in this archaeologically rich area.

All who are interested should regard themselves as eligible for membership in the School. A fee of one guinea will include lectures, discussions and receptions. Accommodation for about 150 members has been reserved. Further information may be obtained by writing to Professor Sybil Gould, Department of Art, The College of Wooster, Wooster, Ohio.

Plains Conference, 1960

The Eighteenth Plains Archaeological Conference was held at the University of Oklahoma from November 24th through November 26th. Approximately 125 persons attended. Dr. Joe Ben Wheat was the Chairman. For most of the following report we are indebted to Miss Carol K. Rachlin.

The papers and the panel discussions showed the increased use of an interdisciplinary approach to the interpretation of archaeological evidence.

Nine of the twelve papers presented on the first afternoon of the meeting were by members of the staff of the

Smithsonian Institution, River Basin Surveys Project. These were principally site reports covering work carried on during the 1960 field season. Three of the papers were of more general interest. G. Hubert Smith reported on the excavations at the historic Fort Sully site, a large and important military post (1866-1894) located twenty-five miles above Pierre, South Dakota. Particularly noteworthy was a large and varied array of glassware of many kinds, including medicine and whiskey bottles. In addition there were objects of metal and earthenware. Mr. Smith concluded his talk by showing a slide of a large military helmet of the period, made of pottery. "Perhaps," suggested the Smithsonian scientist, "this is a whiskey ad?"

William M. Bass, physical anthropologist, told of advances being made as the result of the study of the large number of physical specimens excavated from the Missouri River Basin region. In addition, Dr. Bass cautioned about the removal of skeletal remains, and advised that specimens be removed in a matrix of plaster-of-paris to the laboratory, where the physical anthropologist can do his own excavating.

Dr. Harry E. Weakly reported on progress in preparing a dendrochronology chart for the Plains area. Dr. Weakly said that he and his three colleagues have prepared a chart to A.D. 1500, and hope to extend it back into the prehistoric period.

Dr. Joe Ben Wheat reported on a buffalo kill site in Colorado, excavated during 1960. Dr. Wheat found thousands of bones of the *Bison occidentalis* and in association with them several fluted points and a fine bone needle. He dates the site at approximately 7000 years ago.

At the banquet held in the evening, Dr. J. O. Brew of the Peabody Museum, Harvard, gave an illustrated talk on "Aswan Dam Salvage in Nubia." While salvage is today a world-wide problem, the situation in Egypt is undoubtedly the most spectacular and the most interesting to archaeologists in general.

The Friday morning session was concerned with "Southern Plains Relationships to the South and Southwest." Twelve papers were presented, some dealing with prehistoric, others with historic material. Two were concerned with Texas, two with Okla-

homa, two with Kansas, one with Arkansas and four with Missouri. At the afternoon session the theme was "Southern Plains Relationships to the North and Southeast." Four papers were offered. The one of most general interest was Dr. Carlyle S. Smith's on gun flint manufacture in the Cher Valley, France. During the past summer Dr. Smith visited the last living gun flint maker in France and photographed tools and locale. In addition to showing beautiful slides, Dr. Smith pointed out how one can tell gun flints from Indian artifacts. The second half of the session consisted of a panel discussion of the Aksarben Aspect. A paper was presented by John L. Champe and it was discussed by Messrs. Brew, Hurt, Smith, Spaulding, Stephenson and Wedel.

Friday evening's session was held at the Stovall Museum. A panel of archaeologists and historians set forth "Future Tasks for Anthropology in the Plains." Mr. Savoie Lottinville, Director of the University of Oklahoma Press, served as moderator. On the panel were: Miss Muriel Wright, historian (Oklahoma Historical Society), Dr. Donald Berthrong, historian (University of Oklahoma), Dr. Waldo Wedel, archaeologist (U.S. National Museum), Dr. Frank Hibben, archaeologist (University of New Mexico) and Miss Alice Marriott, ethnologist. While the panel was concerned with future research in the Plains, the problem most pressing to each member was the publication of new research. Mr. Lottinville, in presenting the publisher's problems, made it clear that the high cost of publication compels an independent university press to seek the public market in order to meet production costs. Therefore the archaeologist must write for the general public or else find other means to publish detailed scientific data.

Saturday morning's session was devoted to "Plains Ethnology—the French and Spanish *Entrada*." John Champe spoke on "Early European Contact on the Plains," Al Schroeder on "Spanish Entradas and Identity of Indian Tribes on the Plains." After lunch five "volunteer papers" were offered, presenting material from such various localities as Ecuador, Illinois and Arkansas, and including a discussion of antiquity laws.

At the business meeting it was voted

to hold the 1961 Plains Conference at the Museum of the Great Plains, Lawton, Oklahoma. Marvin E. Tong, Jr., Director of the Museum, was appointed Chairman of the Conference.

Plains Anthropologist

In connection with the Plains Conference, we wish to draw our readers' attention to the fact that the *Plains Anthropologist*, *Journal of the Plains Conference*, has recently resumed publication after remaining dormant for three years. Now in a new and attractive format, this journal has appeared twice in 1960 and henceforth will be published four times a year. The *Plains Anthropologist* deals primarily with the archaeology of the Plains area of North America but also emphasizes general anthropology in this and related areas. It is a basic journal for New World studies, and it will also serve to keep those primarily interested in Old World archaeology up to date on New World developments.

Subscriptions are now \$2.00 a year, and will remain at that price if enough subscriptions are obtained. The 1960 issues are still available. Subscriptions should be sent (and checks made payable) to: James B. Shaeffer, Editor, *Plains Anthropologist*, Research Institute, University of Oklahoma, Norman, Oklahoma.

An Egyptian Statue in Missouri

A fine Egyptian statue has recently been presented to the Museum of Art and Archaeology of the University of Missouri by Mr. Leonard Epstein of New York City. Old Kingdom sculpture of this size and quality is rare. The figure of a seated man is clearly identified by the inscription on one side of the block on which he is seated. It reads: "The Count and Overseer of Priests, Idi." On a smaller limestone statuette of the same individual which is in the Metropolitan Museum of Art he is called "Count, Sole Companion (of the king), Overseer of a Workshop, and Overseer of Priests." Idi is a name well attested in the region of Abydos in Upper Egypt in the late Old Kingdom and the First Intermediate Period. The Missouri statue, thirty-four inches high, is made of sandstone, a material which indicates a provenience in one of the three southernmost provinces of Upper Egypt. An



Statue of Idi, Overseer of Priests, in collections of University of Missouri.

untranslatable title inscribed on the other side of the seat would narrow the choice to the region of Aswan. The date is most likely the end of the VIth Dynasty, about 2200 B.C.

Hasanlu, 1960 Campaign

In our Summer, 1960 issue (pages 118-129) Robert H. Dyson, Jr., Director of the Hasanlu Project, presented a general account of excavations at this important site in northwest Iran. Here he brings us up to date with a report of the most recent campaign:

During the summer of 1960 excavations were again undertaken on the citadel mound of Tepe Hasanlu in Azerbaijan, Iran, supported by the University Museum, the Archaeological Service of Iran and the Metropolitan Museum of Art.

One of the objectives of the campaign was to test the citadel in depth in order to confirm the prehistoric sequence already established from nearby prehistoric mounds (see chart in *ARCHAEOLOGY* 13 [1960] 129). This was done by having a local well-digger cut a core eighteen meters deep from the lowest excavated surface (ten

meters below the highest point of the mound). Excavation was suspended without reaching virgin soil, owing to the presence of ground water. The sequence of pottery recapitulated that already established: Button-base Ware, Painted Orange Ware, Pisdeli Painted Ware and Dalma Impressed Wares. Two earlier phases, Dalma Painted Ware and Hajji Firuz Ware, which were represented by extrusive sherds from the citadel excavations, were not reached in the core.

The second objective was the clarification of the post-Gray Ware Phase (ninth-eighth century B.C.) sequence on the highest point of the mound overlying Burned Building II. Three periods were established stratigraphically: Period I, Islamic of fairly recent date; Period II, a late (?) first millennium phase; and Period III, the Triangle Ware Phase, possibly just pre-Achaemenian. Period II yielded a large building foundation with narrow storage rooms and fireplaces set into mud-brick walls. No objects were found, but it is thought some sherds found on the surrounding slopes represent trash thrown out from this structure. The building was constructed on a leveled area which consisted in part of a platform of mud bricks turned on edge, built against the inside face of the much older fortification wall. Period III represents the end of Iron Age burnished red and buff fine wares and the painted Triangle Ware, all with affinities to Ziwiye pottery.

The third and major objective of the campaign was the further excavation of Burned Building II. This structure proved to have a plan somewhat like that of Burned Building I. At its entrance was a platform of stone on which stood an irregular block of bluish basalt and a sandstone stela. The great columned hall, about twenty-four meters long, contained a mud-brick platform in the rear central area. From the ruins came a large quantity of objects including glazed tile fragments, masses of iron spearheads, ivory fragments, a large alabaster jar, a ram-headed "whetstone," a censer bowl held in a lion's paws, of "Egyptian Blue" glass, molds for casting axes and small objects. The bodies of forty-four people were found strewn around the doorway leading out of the pillared hall into the front rooms of the building. These were mostly young girls laden with copper finger rings,



Gold cloisonné knife handle with inlay of white and blue paste, representing a bearded warrior with pointed cap leaning on a staff. Length 6.5 cm. From Burned Building II, Hasanlu, 1960. Period IV: ninth-eighth century B.C.

bracelets and necklaces of stone and glass. One wore a number of gold disc pendants similar to those seen on Ashurnasirpal reliefs. With the bodies, either singly or in groups of three, were bronze pins in the form of lions, cast on an iron core and attached with a length of copper chain to the wearers' clothing. A group of Assyrian-style cylinder seals was also found.

In another area were remains of a wooden object including fragments of a carved relief showing a man riding a horse. From the storage rooms flanking the pillared hall were recovered fragments of copper belt-strips, crested and conical helmets with ear flaps, a flying horse on an iron disc, and a delicately modeled rhyton in the form of a horse. The helmets are particularly interesting in view of the fact that one of the combat scenes on the Balawat Gates of Shalmaneser III shows a group of Assyrians with their conical helmets battling with mountain people wearing crested helmets! We are still left with the intriguing problem of the identities of the attackers and the defenders at Hasanlu. The problem of the ethnic identification of

the local rulers and the general population in this period must be left in abeyance for the present. The numerous connections with areas known to have been occupied by Hurrian-speaking peoples, and the proximity of the Mannaeans, is most suggestive, at least for the population at large. During the coming summer Mr. T. Cuyler Young, Jr. will continue excavations at Dalma, Pisdeli and Hajji Firuz tepes, while Mr. Dyson takes a well earned rest.

Summer Course at Agrigento

San Francisco State College announces the opening of a Center of Archaeological and Anthropological Studies at Agrigento, Sicily. A summer course in early Mediterranean civilizations will be offered, followed by a field course in archaeological methods. Professors Andreina L. Colonna and Adan Treganza will give the instruction. Further information may be obtained from Prof. Colonna at San Francisco State College, 1600 Holloway Ave., San Francisco, California.

Honors to Archaeologists

It is a pleasure to record the award of well deserved honors to two eminent archaeologists, each outstanding in his field:

WILLIAM FOXWELL ALBRIGHT, authority on the archaeology of Palestine, has received a \$10,000 prize for distinguished accomplishment from the American Council of Learned Societies;

SAMUEL K. LOTHROP, specialist in Peruvian archaeology, has been presented the Viking Fund Medal in Archaeology, awarded by the Wenner-Gren Foundation for Anthropological Research.

Our congratulations to them both!

"Career" Reprints

For the benefit of those—individuals or institutions—who may be interested in securing additional copies of "Archaeology as a Career," by John H. Rowe, we wish to announce that reprints will be available at the following prices: \$2.50 for 25 reprints, \$5.00 for 50, \$8.00 for 100, postpaid. Single copies may be obtained free of charge. Address: ARCHAEOLOGY, 5 Washington Square North, New York 3, N. Y.



REVIEWS OF RECENT BOOKS

ANCIENT MEXICO: An Introduction to the Pre-Hispanic Cultures, by **FREDERICK A. PETERSON**. 313 pages, 24 plates, 6 maps. G. P. Putnam's Sons, New York 1959 \$7.95

To write a good popular book on New World archaeology, particularly on Mexico, is a formidable task because the author faces three problems. First, there are serious gaps in our factual knowledge, and so it is difficult to organize this incomplete information into a coherent account which will make the professional archaeologist happy and still give the layman a readable story. Secondly, the ancient civilizations are sufficiently complex that the archaeologist's monographs become steeped in technical jargon, which makes the telling dull. Moreover, if the archaeological jargon is left out, many professionals will assume that the book is unscientific. Finally, there is so much data on certain aspects of ancient Mexico that it becomes difficult to decide just what should be omitted. Peterson has faced up to all these problems, and has come up with a good, readable and substantially accurate volume on Mexico's ancient history.

His book is well written, entertaining, systematically organized and suitably illustrated. In the first five chapters he gives the general archaeological sequence for all Mexico. For the professional this is admittedly brief, but for the layman it is excellent. The first of these chapters deals with when, where and how man came into Mexico, and it is a competent resumé of the meager archaeological data available. The second chapter, "Man Settles Down in Mexico," is concerned with when man domesticated plants and began to live in villages and towns. This is a good summary of what was known when Peterson wrote the book, but a number of new discoveries (including some Peterson has

made) have added much to the knowledge of this period, and it would be wise to rewrite this section for a later edition. The next chapter, on the more abundantly documented Classic period, is good, though brief. The "Ebb and Flow" and the "Empire Builder" chapters are again excellent, but here, I fear, the inclusion of numerous unfamiliar Indian names may make it difficult going for the lay person.

The final eleven chapters treat individually various aspects of ancient life in Mexico such as art, religion, warfare, cities and so forth. This section is lucid and well illustrated.

Although I was entertained and absorbed while reading the book, I also felt unsatisfied when I closed the last page because there are no conclusions or summary statements. Again, perhaps later editions could include such.

In the future, when I am asked by students, tourists and laymen to suggest a good introductory text on Mexican archaeology, I shall without hesitation recommend Frederick Peterson's volume.

RICHARD S. MACNEISH

National Museum of Canada

ARCHAEOLOGICAL DISCOVERIES IN SOUTH ARABIA, by **RICHARD LEBARON BOWEN, JR.** and **FRANK P. ALBRIGHT**, with contributions by **BERTA SEGALL**, **JOSEPH TERNBACH**, **A. JAMME**, **HOWARD COMFORT**, **GUS W. VAN BEEK** and a foreword by **WENDELL PHILLIPS**. xvii, 315 pages, 214 plates, frontispiece. The Johns Hopkins Press, Baltimore 1958 (Publications of the American Foundation for the Study of Man, Vol. II) \$10.00

This impatiently awaited volume under the general editorship of W. F. Albright is the first of a series covering the results of the expeditions led by Wendell Phillips between 1950 and 1952 in Wadi Beihan (Western Aden Protectorate) in ancient Qataban and

at Marib (Yemen), once the capital of the Sabaean kingdom.

The first part is devoted to an extensive study by Bowen of the ancient irrigation system and cultivation in Wadi Beihan. After convincingly showing that the silt deposits, in many places 15-18 meters deep (one of the most extraordinary sedimentary deposits in the world), are not of natural origin but the result of irrigation, and after a thorough study of the ancient installations buried in the silt, Bowen is able to give a clear picture of the ancient method of irrigation. A system of canals and sluices was built for transporting what the Arabs call the *seil*—water that fills the wadis after heavy rain—down to the field level where ditches divided and distributed the water: thus the water was efficiently dispersed over the fields. There was no attempt, as at Marib, to build a dam; the area behind any dam would rapidly have silted up.

To recover the water absorbed by the silt, the ancient Qatabanians dug wells to the wadi bed, and to distribute it they used what the author calls "irrigation spouts," made of pottery. Such objects were already in use in the fourth millennium B.C. at Beersheba in semi-arid Palestine, possibly for well irrigation but possibly also as gutters on the roofs of the mud houses, an explanation also valid for Beihan. This complex irrigation system did not long survive the days of Qatabanian greatness, and the author rightly underlines the fact that the major irrigation works were abandoned because of social, political or economic changes.

Timna', the capital of the Qatabanian kingdom, was destroyed by fire ca. A.D. 10, as is well established by Comfort's study of imported Roman pottery and glass. The Qatabanian kingdom, which flourished from the sixth century B.C. onward, was subdued by the Kings of Hadramaut who ruled Beihan for more than a century. But

already at that time a sustained effort to carry out the normal maintenance work of the irrigation system seems to have ceased: organized irrigation ceased in Qataban about the end of the second century A.D. The situation was different in Marib, where the celebrated dam built ca. 750 B.C. was still being repaired as late as the sixth century of our era.

The prize find at ancient Timna¹ is a pair of bronze infant riders mounted on lions; this is fully studied by Berta Segall. These statues were cast in South Arabia ca. 75-50 B.C. from Alexandrian molds or models. They reflect the syncretism current in this far-away region which was, however, in contact with the Roman world through the export of frankincense and myrrh. Two South Arabic inscriptions on the bases of the statues, and related inscriptions dealt with by Jamme, yield information of the genealogy of several Qatabanian kings and throw light on the development of South Arabian religion.

F. P. Albright describes and studies part of the great oval temple at Marib, the exploration of which ended in the dramatic circumstances vividly told by Phillips in *Qataban and Sheba*. Dedicated to 'Ilumquh, the moon god, the chief deity of Saba', the temple was founded, according to a dedicatory inscription (read by Glaser, who visited the site in 1888), by the Sabaeen king Yadi' 'il Dhirrih, dated by W. F. Albright to about 650 B.C. The precinct is a large oval area enclosed by a high

limestone ashlar wall constructed on the casemate principle, well known in Syria and Palestine from Solomonic times onward. A large rectangular entrance hall was built slightly later, in the second half of the fifth century. It consists of an open court with sixty-four false windows on the interior, surrounded by a peristyle. Before the triple entrance, on the north, is an outer structure with a row of eight huge monolithic piers probably supporting a roof. A single doorway on the south provides access to the temple, the interior of which was not explored.

On the ESE side of the oval wall there is a beautiful mausoleum of the second half of the fifth century B.C. And this makes still more regrettable the brutal end of the excavation of this unique architectural complex, so revealing of the ancient splendor of the Sabaeen kingdom.

JEAN PERROT

French Archaeological Mission in Israel

STUDIEN ZUR POLYCHROMIE DER PLASTIK.

I. *Aegypten*, by PATRIK REUTERSWÄRD. 68 pages, 6 figures, 12 plates. Almqvist and Wiksell, Stockholm 1958 (Acta Universitatis Stockholmiensis. Stockholm Studies in History of Art, III:1) 14 Kr.

This excellent monograph assembles evidence for the use of polychromy in ancient Egyptian sculpture. The author holds that all Egyptian statues, unless unfinished, were originally to some ex-

tent painted. This opinion is pretty generally accepted for sculptures in limestone. In the earlier periods, as Dr. Reuterswärd shows, there is evidence that carefully finished works in hard stone were also colored, even in the flesh parts, unless the material itself approximated the complexion of human beings. From the New Kingdom on, however, in statues of green and black stone representing divinities and royal personages, the flesh parts were left unpainted. There follows a long and interesting excursus on the colors of the gods as revealed in representations and textual sources. Green and black were, above all, the colors of Osiris, and the author believes that the use of stones of these colors for sculptures of men and women, royal and non-royal, kept pace with the growth of the cult of that god. This valuable study points the need for further investigation of a subject on which there has been too little systematic research.

ELIZABETH RIEFSTAHL

South Essex, Massachusetts

ENCYCLOPEDIA OF WORLD ART. Vol. 1. xxxi, 450 pages (900 columns), 103 text figures, 542 plates (98 in color). McGraw-Hill Book Company, New York 1959 \$38.00

The announcement of the new *Encyclopedia of World Art* created much excitement among art historians and the first volume was eagerly awaited. Its appearance, in both Italian and English editions, has more than fulfilled expectations. The thoroughness of a large proportion of the articles, the copious and almost unexcelled quality of the illustrations, greatly enhance the value of this work, beyond what is usually expected from an encyclopedia. That the first volume, containing fifty-eight articles, does not even complete the letter A gives some idea of the scope of this publication. What had not been anticipated—and this is the aspect that we wish to emphasize here—is the importance of the encyclopedia for archaeology; it is so great that the words "and Archaeology" might well have been added to the title.

Twenty-nine articles, just half those in this volume, are of archaeological importance; some offer more complete and up-to-date information than is available in any other single source. Each is accompanied by a bibliography

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Longmans, Green and Co., New York

which guides one to further pursuit of the subject. Afghanistan and the various parts of Africa, as well as African culture in general, are fully discussed, unfortunately without illustrations other than maps. The art of Roman Africa, on the other hand, is beautifully illustrated. The frescoes of the Ajanta caves are not only completely described but are shown in several color plates. Perhaps the most important single section is that on Andean protohistory, a lengthy and important text accompanied by seventy-three plates and seven text figures. The photographs of architecture, sculpture, textiles, pottery and gold work, many of the last three categories in color, are superb. Another important section, again with the same quality of illustration, is that on Anglo-Saxon and Irish art. Arabia and Arabian art, Archaic art of Greece, Armenian art, are all similarly treated. The final group of articles is on Asia—Central, South and West—and Asia Minor. Here, too, one cannot help but be impressed with the completeness and excellence of the treatment.

No one interested in archaeology, from the layman to the highly specialized professional, in whatever field, will be able to do without this new encyclopedia, to judge from the first volume. Fourteen more volumes are scheduled to appear, at the rate of three or four a year. The significance of this for the study of archaeology is tremendous, for there will be collected here information which often cannot be obtained in any other convenient form. This encyclopedia is, then, of major importance for world archaeology, to say nothing of its wider importance in the whole field of art.

SAUL S. WEINBERG

University of Missouri

INYANGA: Prehistoric Settlements in Southern Rhodesia, by ROGER SUMMERS, with contributions by H. B. S. COOKE, P. V. TOBIAS, H. WILD, J. F. SCHOFIELD, K. R. ROBINSON. xviii, 336 pages, 85 figures, 22 plates, 1 table. Cambridge University Press for the Inyanga Research Fund, Cambridge 1958 \$9.00

Inyanga is an area of over two thousand square miles on the eastern frontier of Southern Rhodesia. Since the end of the last century it has been

known as an area exceptionally rich in traces of antiquity. These have consisted in the main of cultivation terraces, many tracks and pathways, a considerable number of ruined stone buildings and a few monoliths. These remains have been the subject of much speculation and some controversy since in 1905 Randall-MacIver visited them and undertook excavations before going westward to carry out his important pioneer work at Zimbabwe.

This book is the record of how, by local enterprise in Southern Rhodesia, money was raised and a full campaign of field survey and excavation was undertaken in 1950 and 1951. It is a straightforward and very competent account of this work, most of it carried out by Mr. Summers himself. The results, though in no way spectacular, are of considerable interest to the student of African history and provide reasonably certain dating for this group of antiquities.

One of the most useful sections in the book is the long chapter by the late Mr. Schofield, who writes about the beads. His chapter goes far beyond a mere description of the beads from Inyanga itself, and is a very valuable discussion of the whole problem of beads and their value as dating evidence in Southern Africa. The general conclusions drawn as to the comparative unreliability of bead evidence are of course applicable to the rest of the continent.

The results show the remains at Inyanga to be of no great antiquity. Three separate periods have been defined; the first of these, to which the name Ziwa culture has been given, seems to be that of the introducers of iron into the area, and to date from about A.D. 1200 to 1400. This was followed by the Inyanga Upland cul-

ture, which lasted from the early fifteenth century to the end of the seventeenth, and represents the ancestors of the present-day Shona tribes. These people were great builders and the majority of the stone ruins of the area are assigned to them. Some hundred years later, in the eighteenth century, the large group of buildings known as the Vanniekirk ruins were built, and the tradition of stone construction that they exemplify has not yet completely died out, though nowadays instead of forts and cattle pens this building activity seems to be restricted to such simple things as culverts.

Although not revealing any brilliant new culture or throwing great light on historical problems, this book is a solid piece of research which adds yet one more brick to the edifice of African history.

P. L. SHINNIE

University College of Ghana

APPROACH TO ARCHAEOLOGY, by STUART PIGGOTT. x, 134 pages, 12 figures, 8 plates. Harvard University Press, Cambridge 1959 \$3.00

The plethora of popular books on archaeology that has characterized the past decade reflects increasing interest in this field. It becomes evident as one examines these books that two groups are discernible: one, including the works of Cottrell, Ceram, Lissner and others, stresses the sensational aspects of archaeology in an excessively journalistic style. The second group comes from the pens of informed experts who attempt to organize and systematize the fast developing branch that modern archaeology has become. It is not this writer's intention to "editorialize," or even to evaluate the pros and cons of this wave of popu-

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larity for archaeology or the success of the two groups of books. On the other hand, one cannot help pondering the results of their wide distribution (one result being, I am afraid, misinformation and confusion for the layman) as each new publication comes off the press.

There is no need to discuss which of the two groups the present volume belongs to. Professor Piggott is a well known prehistorian and field archaeologist, active in Britain, in Europe and also in India. *Approach to Archaeology* starts off promisingly with a sound definition of the aims and scope of archaeology, emphasizing skilfully the ways and means by which archaeologists obtain information. "Discipline" is a word which has not been frequently enough associated with archaeology. Mr. Piggott uses it judiciously, and his definitions and illustrations fully justify his terminology. He reviews the tools, methods and techniques available to the archaeologist, and the innumerable questions of interpretation and dating of ancient artifacts. Finally, he examines the various problems facing the prehistorian and the historical archaeologist. Although the chapters dealing with methods and techniques are well conceived and reveal Piggott's great experience, the development of the material is not always satisfactory and is often lacking in good organization. Chapters II and III, dealing respectively with methods and techniques, and the establishment of chronology, introduce points pertinent to both discussions, but their poor cohesion results in a scattering of information which for the general reader spells confusion and misunderstanding. It is particularly regrettable that the relationship between archaeologists in the field and in the laboratory is not clearly explained. Furthermore, illustrations and examples are not provided as abundantly as they could be. The correlation of text and illustrations leaves much to be desired: I could not find any reference in the text to a plate or a figure. It is useless to adorn a book with complicated charts and diagrams if no explanation of their mechanism is provided. One wonders if the illustrations were not simply added for the publication, since Mr. Piggott states that "the substance of the book was given as a lecture course to teachers of history in Scot-

tish schools." In their more satisfactory organization and greater clarity, S. J. De Laet (*Archaeology and its Problems*) and Sir Mortimer Wheeler (*Archaeology from the Earth*) fared much better than Piggott, and consequently their books are more successful for the layman; in this writer's opinion, however, no archaeologist has yet produced an entirely successful examination of his discipline and its mechanics. Wheeler came very close to it. Perhaps the very vitality and versatility of archaeology in its modern phase render perfection in this matter difficult to reach.

KENAN T. ERIM

New York University

JAPAN BEFORE BUDDHISM, by J. EDWARD KIDDER, JR. 282 pages, frontispiece in color, 65 figures, 108 plates, 7 maps. Frederick A. Praeger, New York 1959 (Ancient People and Places, 10) \$5.50

This is a concise and authoritative summary of the results of Japanese archaeology on the periods up to the seventh century A.D. Dr. Kidder has drawn upon the voluminous Japanese-language literature and his first-hand knowledge of the sites and artifacts. The book is thus an excellent aid for archaeologists working in other regions who cannot read Japanese. A selective bibliography furnishes the means for pursuing specific topics more thoroughly.

A short introduction provides geographical orientation for the general reader. Chapter I concerns the rather few artifacts of the pre-pottery ages. Chapter II deals with the Jomon ("cord pattern") period which "may be characterized throughout most of its evolution as a retarded Neolithic. . . . Only primitive agriculture on a small scale seems to have been known." (pages 32-33). The five phases of the Jomon period extend from ca. 4500 to ca. 250 B.C., and are represented by an abundance of shell-mounds, pottery, implements, dwelling sites and skeletal remains. "Jomon man was only thinly blended with Mongoloid features; this element later dominated under the large migration of Yayoi times." (page 89).

The Bronze-Iron age came in with the "Yayoi" culture (ca. 300 B.C. to A.D. 300), which crossed over from Korea to Kyushu and spread east and north along the archipelago, distribut-

ing the use of metals, rice and new pottery and dwelling types. There is evidence of some cultural continuity between Jomon and Yayoi.

Chapter IV deals with the Protohistoric or "Tomb" period (third to seventh centuries), known archaeologically from numerous tomb mounds and historically from a few references in Chinese annals and from eighth-century Japanese historical traditions. In this period as in the preceding one, continental influences were the sources of change but were rapidly modified by native traditions. Early Shinto shrine architecture is typical: "This talent for harmonizing the introductions with established native practices was exercised during a half-millennium of pre-Buddhist centuries." (page 207).

The author avoids speculation on many wider problems where the historian would welcome evidence from archaeology. For instance, the evidence of Korean sources for the Yayoi culture provides support for a theory that the Japanese language is an Altaic speech that came to the islands from Korea late in the first millennium B.C. It will be interesting to see whether glottochronology confirms this.

RICHARD H. ROBINSON

University of Wisconsin

CIBA FOUNDATION SYMPOSIUM ON MEDICAL BIOLOGY AND ETRUSCAN ORIGINS, edited by G. E. W. WOLSTENHOLME and CECILIA M. O'CONNOR. xii, 255 pages, numerous text figures, plates and maps. Little, Brown, Boston 1959 \$9.50

The idea for this symposium grew out of an after-dinner conversation between D. S. Kirk and F. G. Young in Trinity Hall, Cambridge, and when it "still seemed good" the next morning, Prof. Young made preparations to present it to the Foundation. R. M. Cook was responsible for much of the organizational work and, at the symposium itself, for an excellent introductory address and astute chairmanship. In choosing the topic for this, their fiftieth symposium (London, April 1958), the Foundation broke away from their usual strictly medical subjects.

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ics, philology and hematology. The first speakers outlined the history and geography of the area, the major studies and approaches already made, and the possibilities for future research. Later speakers discussed population movements, bone measurements, genetical characters of populations and blood group distributions. Well chosen illustrations and detailed maps (perhaps a few more of these would have been helpful) add to the usefulness of the book.

The discussions, motions and appendices re-emphasize the eagerness to learn about the needs and methods of other disciplines so that each investigator's work will be useful in as many fields as possible. The papers dealing with the relatively new methods made possible by advances in the knowledge of blood grouping and the increased inter-disciplinary understanding and cooperation may well provide the most productive results of the symposium.

A refreshing spirit of cooperation pervades the whole symposium. Here are no single-minded investigators fighting for their own theories in narrow-minded futility. The atmosphere of the meeting is summed up by Prof. Luisa Banti: "I confess my own

ignorance: I do not know who the Etruscans were, nor where they came from, when they arrived, and if they arrived. We appear to have reached a dead end. This is why I like the idea of getting outside help in an attempt to reach a solution." The papers and general discussions present an exciting and optimistic picture for the future of Etruscan studies. Facts, theories and humor are blended into a delightful volume.

WILLIAM K. BEATTY

*The Medical School
University of Missouri*

THE AZTEC: Man and Tribe, by VICTOR W. VON HAGEN. Illustrated by ALBERTO BELTRAN. 222 pages, 55 figures, 21 plates. New American Library, New York 1958 (Mentor: Ancient Civilizations) \$.50

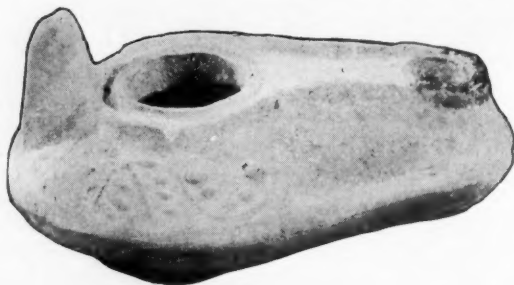
This is the second volume of three by the same author concerning the most developed cultures of the Americas. Like the first one, on the Incas (ARCHAEOLOGY 11 [1958] 296-298), it is divided into four parts, and the same faults are again present. Some of them are more serious this time, since the author is obviously not so

well versed in Central Mexico as in the Central Andes. The chapters on the settlement and the pre-Aztec cultures are confusing and sometimes entirely misleading. To call Teotihuacán the capital of the Toltec cannot be justified, as it was when Vaillant held this opinion twenty years ago. The interpretation of the La Venta culture is very shaky, and there is no reason why the Pipiles in Central America should be the remnants of Aztec traders, as von Hagen says. There are many other points, too many to be mentioned here, such as the statement that jade was found in southern Mexico. The gravest fault seems to be made in the interpretation of the *tonalpohualli*-calendar. Here the author states that the "month" (the 13-day period) has the same sign all the time, running through the numbers from 1 to 13, while actually the numbers and signs run parallel to one another, i.e., the sequence is not 1-rabbit, 2-rabbit, 3-rabbit, etc. (page 165) but 1-rabbit, 2-water, 3-dog, etc. It is also incorrect to say that the *nemontemi* were unnumbered and unnamed (page 165), since these five days provided the means for shifting the first sign of the year. The four signs by

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which the year could begin through this rotation were of great augural importance for the Aztecs.

The book is illustrated and contains a useful index. Some passages, especially when taken from the old Spanish sources, are well written. Unfortunately, the translation of Sahagun by Anderson and Dibble was not used, and therefore much important new material was missed. The general reader, especially the beginner, must be cautious of this book. For him the older popular books, like those of Vaillant or Soustelle, make far better and more useful reading.

WOLFGANG HABERLAND

Hamburg Museum for Ethnology

ARCHAEOLOGICAL EXCAVATIONS IN THE NORTHERN SIERRA MADRE, OCCIDENTAL, CHIHUAHUA AND SONORA, MEXICO, by ROBERT H. LISTER, with reports by PAUL C. MANGELSDORF and KATE PECK KENT. vii, 121 pages, 21 figures, 33 plates, 13 charts. University of Colorado Press, Boulder, Colorado 1958 (University of Colorado Studies, Series in Anthropology, No. 7) \$3.50

Northwestern Mexico is one of those areas of the New World which are important as a link between centers of cultural climax, in this case the southwestern United States and central Mexico. Nevertheless, little detailed archaeological work has been done there, and the observations of Lumholtz, Blackiston, Hewitt, Carey, Brand, Sayles and Kidder, based heavily on surface collections, have provided a tantalizing introduction to the culture history of the region. Lister's recent work has begun to fill this important gap. The present volume is the culmination of four field sessions (1951-1955) and can be considered a major contribution to the archaeology of this region.

Lister's main objective in the northern Sierra Madre Occidental area was to locate archaeological deposits which would provide clues to culture history on an earlier time level than the Casas Grandes period that was said by earlier workers to be the dominant surface manifestation. In three areas—two in northwestern Chihuahua and one in northeastern Sonora—deposits in several large but shallow caves were excavated. Although none had the depth that had been hoped for,



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Lister did recover enough information to produce a number of significant conclusions. The body of the report is a description of the caves, their features and artifactual contents. These are illustrated by excellent drawings and photographs, although the report would have been enhanced by the addition of relief to the map, to give a better idea of the physical relationships between the areas and sites.

The occupation of the area is divided into three periods. Before A.D. 900 the caves were only camped in, and little archaeological material was left. Following a gap in usage, a Mogollon occupation began sometime about 900. This is assumed to have spread as part of the expansion of Mogollon culture from southern Arizona and New Mexico. At this time a well developed agricultural economy existed, and mud-walled houses were occupied in the mouths of the shelters.

Lister believes the last occupation period is not Casas Grandes, as was earlier assumed, but simply a continuation of the earlier Mogollon culture with Pueblo influence. At about A.D. 1000 great cliff dwellings, with up to thirty rooms and as many as three floors, were constructed, especially on the more remote cliffs. By 1100 these were abandoned, the population moving east into the river valleys of the Sierra Madre to add to the development of the Casas Grandes configuration. By this time the culture had lost most of its Mogollon character and was basically Pueblo in nature. A

great deal more work is needed in this area to substantiate fully and expand these hypotheses, and it is hoped that the sound beginning made in this report will be followed with further field work and reporting.

DOUGLAS W. SCHWARTZ
University of Kentucky

DIGGING INTO HISTORY: A Brief Account of Fifteen Years of Archaeological Work in New Mexico, by PAUL S. MARTIN. Drawings by GUSTAF DALSTROM. 157 pages, numerous illustrations, 1 map. Chicago Natural History Museum, Chicago 1959 (Chicago Natural History Museum Popular Series. Anthropology, No. 38) \$1.50

"The purpose of this book is to piece together all the bits of the Mogollon Indian jigsaw puzzle that we discovered in New Mexico in our fifteen years of digging there." With these words the author has prefaced a compact and lucid summation of the excavations he conducted in the Pine-lawn Valley and vicinity.

A dozen major reports have been published as a result of the series of expeditions Dr. Martin has led into the mountains of western New Mexico. These are available to all but, like most books of this nature, are mostly read and used by archaeologists. Growing public interest has created a demand for syntheses of archaeological knowledge which present, without professional jargon, what is known or deduced about aspects of prehistoric life.

Digging Into History furnishes this information for those ancient southwestern Indians we call Mogollon.

In order to create a perspective so that the Mogollon people can be placed in their proper setting in both time and space, Dr. Martin has written a prologue and two introductory chapters. The prologue deals mainly, and with a very broad brush, with the advent of man into America, the early hunting cultures and the development of traits such as agriculture and pottery making. The next chapter summarizes our present knowledge of the three other major divisions of prehistoric southwestern peoples. Then follows a very nice account of just why Martin chose the area on which he was to spend so much time, effort and money. This chapter also describes many of the techniques of excavation.

From this point on the book is taken up with an account of the cultural development of the Mogollon Indians, traced from its recognizable beginnings in the Archaic Cochise culture to the dispersal of the group about A.D. 1350. During these several thousand years a rich and varied material culture was enjoyed by the Mogollon. Because sev-

eral seasons were spent digging in dry caves, notably Tularosa Cave, an extensive collection of normally perishable materials was recovered, adding greatly to our knowledge of the material culture of these people.

With the artifacts recovered during the excavations and with the remains of houses and ceremonial structures, Dr. Martin has constructed a rather full picture of the life of the Mogollon Indians.

CHARLIE R. STEEN

*National Park Service
Santa Fe, New Mexico*

A HISTORY OF SCIENCE. Volume II: Hellenistic Science and Culture in the Last Three Centuries B.C., by GEORGE SARTON. xxvi, 554 pages, 112 figures. Harvard University Press, Cambridge 1959 \$11.00

This is the last volume to come from the pen of one of the most prolific scholars of this generation, the acknowledged dean of historians of science at the time of his death. Dr. Sarton's crusade on behalf of his beloved field of research resulted in its becoming recognized as a full-fledged discipline in American universities. At the same

time he achieved the rare distinction of becoming a familiar figure in the scholarly world outside his field.

To Dr. Sarton science was "the totality of positive knowledge" and his conception of the history of science embraced all fields that contributed to positive knowledge. Dr. Sarton was himself a combination of a trained scientist and a Renaissance type of humanist. An eminent expert in his field compared him to Aristotle in his range of interests and his desire to integrate the branches of knowledge. After a thorough philological and scientific schooling, culminating in scientific courses of study at the University of Ghent, Dr. Sarton came to America and set up quarters at Cambridge. Drawing upon his command of most of the languages of Western Europe and a scholar's control of Latin, Greek and Arabic (the last a later acquisition), he combed the resources of Widener Library as they had seldom been or will be combed hereafter.

His breadth of interest and extraordinary capacities for research, both humanistic and scientific, made him somewhat contemptuous of narrow specialists, and they in turn took him to



Rare Ancient Egyptian Carved Wood Model, of Middle Kingdom. Servants engaged in a household activity, possibly bread making. Good condition. Length 13 inches. A fine Museum piece.

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task for invading fields quite removed from his central focus. In Volume I of the present work Dr. Sarton held up for scorn some rather learned but obtuse products of Classical scholarship and delivered himself of some sharp judgments on matters of literature and art. In doing so he became vulnerable to criticism from Classicists. He was roundly and properly rebuked for being taken in by Fite, Popper and other detractors of Plato. His naiveté here reminds us of Thomas Huxley's pronouncement of Wolf's *Prolegomena* as a great achievement of scientific scholarship.

The present volume continues Dr. Sarton's account of the science and culture of the ancient world. Again he gives full-scale treatment to philosophy and religion, historiography, arts and letters, philology and social backgrounds, as well as to the various branches of science, and again he has exposed himself to critics, especially in the field of literature. But it must be remembered that the classics were only one of Dr. Sarton's intense passions; that he plunged in with verve is not altogether regrettable. A pleasant sojourn at the Villa Vergiliana at Cumae and excursions to the Phlegraean region gave him new insights into the writings of natural scientists and philosophers about those mysterious localities. Classicists could always count on finding some fresh bit of information that Dr. Sarton had dug out of Widener Library or had gleaned from communications or visits abroad. His stimulating mind and pen will be sorely missed.

WILLIAM H. STAHL

Brooklyn College

MASADA, SURVEY AND EXCAVATIONS, 1955-56, by M. AVI-YONAH, N. AVIGAD, Y. AHARONI, I. DUNAYEVSKY, S. GUTMAN. 60 pages, 22 figures, 16 plates. Israel Exploration Society, Jerusalem 1957 (Reprinted from Israel Exploration Journal, Vol. 7, No. 1)

Headed by M. Avi-Yonah, N. Avigad and Y. Aharoni, a team of Israel archaeologists and volunteers attempted, under very difficult conditions, to identify the sumptuous palace said to have been built by King Herod in the Judean desert, on the rock of Masada, 1700 feet above the Dead Sea on its western shore. Their report comprises a description of the ruins found at the

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northern end of the rock, in particular of a residence of Hellenistic style built perhaps at the time of the Hasmoneans and rebuilt by Herod with the addition of an upper story. From a semicircular terrace whose boundary wall skirted the cliff edge a secret passage was cut through the rock, going down twenty meters on the flank of the mountain to a second platform partly built and partly cut in the rock, on which stands an enigmatic circular structure 15.30 m. in diameter. From this platform a built staircase led down to another square terrace from which the rock falls off steeply on three sides. The view to the Dead Sea and the mountains of Edom and Moab is breathtaking. Here stood a gracious hall nine meters wide surrounded by pillars and plastered columns 4.15 m. high.

The other structures and buildings (barracks, arsenal, etc.) of the extensive Herodian fortress are also described, as well as the cisterns, the total capacity of which is estimated at 40,000 cubic meters. These first results already help to recreate something of the cadre of the last episode of the Jewish War in A.D. 73 and of the tragic last stand of the besieged.

JEAN PERROT

French Archaeological Mission in Israel

KHAMI RUINS: Report on Excavations Undertaken for the Commission for the Preservation of Natural and Historical Monuments and Relics, Southern Rhodesia, 1947-1955, by K. R. ROBINSON, with reports by G. BOND and E. VOCE. xv, 191 pages, 50 figures, 28 plates, frontispiece in color. Cambridge University Press, New York 1959 \$7.50

In its early days Southern Rhodesia earned a somber reputation with re-

gard to its ancient monuments; the watchwords of its financial promoters had been Grab and Gold. But, at first under amateur inspiration, its Monuments Commission has done admirable work since the war; and this book shows how much can be made of a not very promising site which had fortunately been spared the attentions of the treasure seekers.

Khami is a steep hill, prettily situated above the reservoir for Bulawayo. Its intricate system of walls and huts, less impressive than Zimbabwe, has been cleared and studied; careful descriptions of pottery and other objects present an African culture of the eighteenth century; and a note is added on a prehistoric deposit which is fully published elsewhere. Burials of the Khami culture have not been found. Khami being remote and perhaps not an important capital, trade-goods are lacking; the tale of Portuguese missionaries is regarded with doubt.

Chronology is the headache of the African archaeologist. Datable objects are never common, and Africans were given to picking them up, re-using and reburying them. Beads are extremely difficult and little known. Radiocarbon on a site so recent would tell nothing. In Africa there is no short cut; methodical survey and excavation of numerous sites can alone give materials for a satisfactory sequence. Mr. Robinson gives us one site; we may be sure that he and the Commission will investigate others and piece together a solid framework in which romanticism, political ideology and conjecture, hobgoblins hitherto of Rhodesian archaeology, will find no place.

O. DAVIES

University College of Ghana

VOTIVE RELIGION AT CAERE: PROLEGOMENA, by QUENTIN F. MAULE and H. R. W. SMITH. x, 136 pages, 8 figures, 5 plates. University of California Press, Berkeley and Los Angeles 1959 (University of California Publications in Classical Archaeology, Vol. 4, No. 1) \$3.00

Perhaps in no way does archaeology tell us more about the religion of the ancient world than through the vast number of terracotta figurines presented to the gods (usually, it is supposed, in fulfillment of a vow—hence "votive"). And yet surprisingly little attention has been given to the information they can provide on the character of the cults and the very cultures to which they belong. Professors Maule and Smith not only prove that a group of terracottas from Etruscan Caere (Cerveteri) represents gods and not Gauls (as has been assumed up to now) but open a fascinating vista of the cults of central Italy and show how they and their votive objects differ from those of Old Greece and Greek Sicily and Italy and from neighboring regions of Italy to the north and east. It is, therefore, unfortunate that the writing is at once so involved and diffuse that one hesitates to recommend this valuable work to the general reader. Scholars, however, will use it constantly and with great profit.

MICHAEL H. JAMESON

University of Pennsylvania

BOOKS FOR BEGINNERS

ARCHEOLOGISTS AND WHAT THEY DO, by ROBERT J. BRAIDWOOD. 180 pages. Franklin Watts, New York 1960 \$3.95

This book is designed to accompany others in a "What They Do" series, presumably for junior high and high school readers. Eminently readable and informative, it will be of value to the college or graduate student of anthropology and of pleasure to anyone interested in archaeology. Braidwood is clear and detailed on what archaeological training involves and what a student faces financially and academically, on how a dig is run, and on the larger meaning of discoveries and investigations in relation to the history of man. By descriptions based on real situations in his Near Eastern work, the

author brings alive many facets of archaeological research. *Archeologists and What They Do* is the next best experience to going into the field, particularly if read with Linda Braidwood's *Digging Beyond the Tigris* (Schuman, New York 1953).

NATHALIE F. S. WOODBURY
Arizona State Museum

THE WALLS OF WINDY TROY: A Biography of Heinrich Schliemann, by MARJORIE BRAYMER. 189 pages, 16 pages of illustrations, 1 map. Harcourt, Brace, New York 1960 \$3.50

GOOD DIGGING: The Story of Archaeology, by DOROTHY and JOSEPH SAMACHSON. 224 pages, 32 illustrations, 11 maps. Rand McNally, New York 1960 \$3.50

THE STORY OF ARCHAEOLOGY IN THE AMERICAS, by MARY ELTING and FRANKLIN FOLSOM. Illustrated by KATHLEEN ELGIN. 169 pages, numerous line drawings, 4 color plates, 4 maps. Harvey House, Irvington-on-Hudson, New York 1960 \$2.95

As beneficiaries of the spate of popular books on archaeology the younger generation has come off as well as, or better than, the older. The three books reviewed here are examples of good writing for young people.

Miss Braymer's biography of Schliemann makes him a much more attractive human being than he has been portrayed elsewhere. Instead of emphasizing his "passion for gold" and his undoubtedly complex psychology, she has concentrated on Schliemann's lifelong ambition to find Troy and on the results he achieved. The narrative is lively, absorbing and not "written down." The book might have been a bit longer, for events sometimes leap onward with disconcerting speed, but on the whole it is excellent. The photographs are an interesting selection and well reproduced.

Good Digging is a masterpiece of condensation—the story of discoveries in every part of the world is compressed into 182 pages, and there are still twenty-six left for the description of an archaeologist's training, the organization and conduct of an expedition and "the value of archaeology." Despite the brief treatment of each subject the narrative reads well and the facts appear to be accurate. This would be a good book to hand a teen-

ager whose interest in archaeology is just beginning.

In a less extensive area, and with much more detail, *The Story of Archaeology in the Americas* tells of many important discoveries and emphasizes their significance. Apparently directed toward a slightly younger audience than is the Samachsons' book, the account is well written and includes numerous attractive drawings which supplement and enliven the text. The book should stimulate interest in American archaeology, and the extensive bibliography and list of archaeological organizations appended will help to further that interest.

It is worth noting that both this volume and *Good Digging* emphasize the importance of professional guidance for amateur diggers. Let us hope that this excellent advice is followed!

G.D.W.

THE FIRST COMERS: Indians of America's Dawn, by ALICE MARRIOTT. viii, 246 pages, numerous line drawings. Longmans, Green, New York 1960 \$4.50

For some time interested readers of all ages have been asking anthropologists for a clear, non-technical but authoritative survey of North American archaeology. *The First Comers* is such a book. Starting from the known, history, the unknown, archaeology, is revealed. The method is a game, in which libraries and museums serve as the playing field, with books and documented artifacts being the instruments of play. The rules of the game are the fundamental concepts of anthropology. The requirements for the players are interest, intellectual honesty and the ability to work unselfishly together.

The game begins in the library where the necessary background knowledge is found. Next, to the museum. The museum story opens with the Archaic period in North America. We are taught how to read museum displays by means of an area in western Arkansas. The life of the Archaic peoples is revealed through specimens of tools, food and clothing. After this each archaeological section of the United States is treated separately. No site reports are used; each culture area is a dynamic scheme of culture development starting with history and projecting backward in time to prehistory.

Humanistic values do not overshadow scientific honesty and caution.

Miss Marriott keeps warning the reader against the destruction of scientific evidence. These warnings are climaxed in her description of what happened at Spiro Mound, Oklahoma. She presents the most exact account of how Oklahoma archaeologists struggled to salvage the maximum scientific data after wholesale destruction had taken place. This chapter will be extremely valuable to the professional as well as to the amateur, who will learn of the greatest tragedy in American archaeology.

To Miss Marriott archaeology is a science; in its applied form it must be practised with precision under established rules. Diverse techniques are explained: how to make an archaeological survey, how to dig a cave, how to excavate a mound. Methods of interpreting data are illustrated: the use of historical documents, the effect of ecology on material culture and cross-dating of artifacts. Techniques of dating are discussed: where did we get Carbon 14 dating, what is it and how used? What dendrochronology is, and how used, is minutely described in connection with the Southwest cultures.

Miss Marriott devotes two chapters

to museums, giving their history, telling what they do, how they get their collections and who are the people behind them. The last chapter concerns the "hobby archaeologist" and community-groups such as the Boy Scouts. Again Miss Marriott returns to the museum, but this time to draw upon her own knowledge and experience, to give practical advice on how to set up a museum.

To people of all ages this book will be welcome; to the informed it may appear too generalized. In areas where the author is most familiar the dynamics of culture become living realities, while in areas less familiar to her the vividness of culture is somewhat diminished. All will agree, however, that Miss Marriott fulfils her objective:

"Most especially I should like to give other people the sense of sharing and belonging that is a part of archaeology in the field and in the museum. Tennyson makes Ulysses say, 'I am a part of all that I have met.' It is a good motto for anybody; it is a necessary motto for those of us who are interested in the peoples of the past."

CAROL K. RACHLIN

Oklahoma City

BRIEF NOTICES

GREEK AND ROMAN PORTRAITS, 470 B.C.-A.D. 500. Unpaged, 73 figures. Museum of Fine Arts, Boston 1959 \$1.50

Using sculptures in stone, bronze, bone and terracotta, coins, gems and paintings, largely in the Boston Museum but some from nearby museums, the development of ancient portraiture over a period of a millennium is amply illustrated. A brief text speaks in general terms; the fine photographs of choice examples and the brief captions fill in the details and leave little to be desired.

BETH SHE'ARIM, 1936-1940. Vol. I: The Catacombs I-IV, by BENJAMIN MAZAR (MAISLER), Second edition. x (English summary), 156 pages, 29 figures, 36 plates, 9 plans. Israel Exploration Society, Jerusalem 1957

The second edition of the archaeological report on the first phase of the exploration of Beth She'arim in Western Galilee. From the time of Herod until its destruction in A.D. 351 by Gallus Caesar, Beth She'arim was a flourishing city with a fine synagogue;

Aaron Furman precolumbian and primitive art



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after the burial of Rabbi Judah Hannasi, in the second half of the second century, it became a central burial place for the Jews of Palestine and neighboring countries. Extensive catacombs with rock-cut funerary halls and masonry doorways, good examples of early third-century architecture in Palestine, reveal the popular Jewish art of the Roman period. More than two hundred inscriptions, most of them in Greek, are of great importance for the study of Jewish proper names of the Roman period both in Palestine and in the Diaspora; they are a source of information on social and economic conditions, and shed light on the spiritual culture of Israel at the time of the Mishna and the Talmud.

ALGERIE PREHISTORIQUE, by LIONEL BALOUT. 182 pages, 147 plates. 4 in color, 2 maps. Arts et Métiers Graphiques, Paris 1958 (Ministère de l'Algérie, Sous-direction des Beaux-Arts)

Full-page photographs here display the riches of Algeria from the Palaeolithic to the beginning of our era. The views of the major sites of the Aterian, Capsian, Ibero-Maurusian, Neolithic and later cultures are of especial interest because they show the sites themselves and their geographical setting. The illustrations of the cultural assemblages are excellent; they are accompanied by a brief text outlining the development of Algeria in pre- and protohistoric times.

OLD STONE AGE, by STEVAN CÉLÉBONOVIC. Commentary by GEOFFREY GRIGSON. 96 pages, 72 plates. Philosophical Library, New York [1957] \$10.00

Stone Age art is enjoying a new vogue, for its appeal to the modern artist as well as to the devotee of mod-

ern art is great. Photographers have vied with one another to present both the cave art and the mobile art of the Palaeolithic period to best advantage. None has been more successful than Stevan Célebonovic. Here, too, are stone and bone tools and weapons and a few photographs meant to show the physical background of man in the Old Stone Age.

THE SCEPTER OF EGYPT, A Background for the Study of the Egyptian Antiquities in the Metropolitan Museum of Art. Part II: The Hyksos Period and the New Kingdom (1675-1080 B.C.), by WILLIAM C. HAYES. xv, 496 pages, 275 figures, frontispiece, map. Harvard University Press, Cambridge 1959 \$15.00

The second volume in its series, this is a brilliant book within its limited field. The illustration of Egyptian objects in the Metropolitan Museum, the 22-page bibliography and the chronological tables are excellent. The history is that able treatment which we have come to know from the author. The limitation is that a history written for understanding a museum collection is incomplete in its coverage and inevitably to be compared with what Dr. Hayes might have done in a straightforward history. In the absence of such histories, up-to-date and in English, this must stand at the head of the bookshelf.

SAMOTHRACE, A Guide to the Excavations and the Museum, by KARL LEHMANN. Second revised edition. 106 pages, 54 figures, 1 plan. Institute of Fine Arts, New York University, New York 1960 \$1.50

After five years, the guide to the excavations and the museum of Samothrace has appeared in a second edition, designed to add new information obtained in recent excavations and to

bring the text up to date. But in addition to serving as a guide to the site, it will be a valuable supplement to the preliminary excavation reports, pending the appearance of the final publications. The reduced price of the new edition is most welcome.

LOVES AND LOVERS IN ANCIENT POMPEII (A Pompeian Erotic Anthology), by MATTEO DELLA CORTE. English version by A. W. VAN BUREN. 135 pages, 19 figures, 6 plates. Published by the author, Pompei Scavi (Naples) 1960 \$3.20

Already noticed in the original Italian edition, this anthology of erotic inscriptions in Pompeii appears now in an English translation. The inscriptions, many of which are shown in the plates, are grouped according to various aspects of the love-life of the Pompeians and are given both in the Latin and in translation. The sum total is a vivid impression of the course of love in ancient Pompeii.

DIE LÖWENKOPF-WASSERSPEIER VOM DACH DES ZEUSTEMPELS, by FRANZ WILLEMSEN. viii, 134 pages, 4 figures, 123 plates. Walter de Gruyter, Berlin 1959 (Olympische Forschungen, Band IV) DM 60

A detailed study, with complete photographic documentation, of the original marble lion's head spouts from the roof of the Temple of Zeus at Olympia and of the various replacements, beginning in the late fifth century B.C. and continuing into the fourth century A.D.

ARCHAEOLOGISCHE UEBERSICHTSKARTE DES ALTEN ORIENTS, mit einer Katalog der wichtigsten Fundplätze. 64 pages, 1 map. Hermann Böhlaus Nachfolger, Weimar 1959 DM 9.60

Together with a large map of the ancient Orient, from the eastern Mediterranean to the China Sea, there is an index of the most important archaeological sites in each of the following regions: Egypt, Palestine, Syria, South Arabia, Iraq, Iran, Turkey, Cyprus/Crete, the Soviet Union (Crimea, Caucasus, the Asiatic areas), Southeast Asia and East Asia. For each site there is given its location on a map, brief notations on the nature and date of the occupation of the site, and the major bibliographical references.

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